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A COMPARATIVE INVESTIGATION OF THE LEARNING AND SOCIAL ADJUSTMENT OF TRAINABLE CHILDREN IN PUBLIC SCHOOL FACILITIES, SEGREGATED COMMUNITY CENTERS, AND STATE RESIDENTIAL CENTERS.

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THE STUDY SOUGHT TO DETERMINE THE FEASIBILITY OF INCLUDING THE TRAINABLE CHILD (IQ 25-50 INCLUSIVE, AND BELOW M.A. 8) IN THE PUBLIC SCHOOL PROGRAM. APPROXIMATELY 27 CHILDREN IN THE TRAINABLE CATEGORY WERE DIVIDED INTO 3 EQUAL GROUPS AND PLACED IN A 2-YEAR CONTROLLED-CLASSROOM PROGRAM AT EACH OF 3 TYPES OF FACILITIES--A TYPICAL CITY ELEMENTARY SCHOOL, A LOCALLY SPONSORED CENTER FOR TRAINABLE CHILDREN, AND THE STATE INSTITUTION FOR RETARDED CHILDREN. USING SUCH DATA AS ETIOLOGICAL AND FAMILY HISTORY, MEDICAL EXAMINATION, PSYCHOMETRIC AND RELATED TESTS, PLUS COMPARATIVE SCORES OF ACHIEVEMENT ON PRACTICAL TASKS TAUGHT, ON SOCIAL MATURITY SCALES, AND ON EMOTIONAL GROWTH OF SUBJECTS, AN ATTEMPT WAS MADE TO EVALUATE WHICH TYPE OF FACILITY OFFERS MAXIMUM GROWTH AND PROGRESS TO THE PUPILS. THE INFORMATION YIELDED BY THIS RESEARCH INDICATED THAT TRAINABLE CHILDREN DID MAKE SIGNIFICANT PROGRESS IN AN ORGANIZED PROGRAM WHICH WAS UNDER THE DIRECTION OF COMPETENT TEACHERS, AND THAT THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN THE LEVEL OF AVERAGE OVERALL PROGRESS FOR THE THREE EXPERIMENTAL GROUPS. THE INFORMATION OBTAINED FROM THE STAFF OF THE PUBLIC SCHOOL WHERE ONE EXPERIMENTAL CLASS WAS HOUSED INDICATED THAT THE CLASS FOR TRAINABLE CHILDREN WAS NOT CONSIDERED A DISRUPTING FACTOR NOR A NEGATIVE INFLUENCE, AND THAT IT WAS ACCEPTED BY THE TEACHERS AND THE SO-CALLED "NORMAL" CHILDREN IN THAT BUILDING. (GC)

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A Comparative Investigation

of the Learning and Social Adjustment of Trainable Children in Public School Facilities, Segregated Community Centers, and State Residential Centers

Project Director: **John R. Peck, Ph.D.**

Research Associate: **C. Lucille Sexton, Ph.D.**

THE UNIVERSITY OF TEXAS · AUSTIN
May, 1960

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U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
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Project Director: John R. Peck, Ph. D.

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THE UNIVERSITY OF TEXAS

May, 1960

FOREWORD

This study is an investigation authorized as Project Number SAE 6430, Cooperative Research Program, United States Department of Health, Education and Welfare, Office of Education. The title of this study is as follows:

A Comparative Investigation of the Learning and Social Adjustment of
Trainable Children in Public School Facilities, Segregated
Community Centers, and State Residential Centers

This project was completed in August, 1959, in the Department of Educational Psychology, College of Education, The University of Texas, Austin, Texas, by Dr. C. Lucille Sexton, Research Associate, and was directed by Dr. John R. Peck, Assistant Professor Educational Psychology.

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John R. Peck

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CHAPTER I

THE BACKGROUND OF THE PROBLEM

A. Introduction

Professional personnel in special education and parents of mentally retarded children have been concerned for many years with the training and placement of trainable children because there has been little done toward organizing a formal program for this group. Rothstein (31) points out that parents often are advised to institutionalize this child; however, as the parents become better informed in regard to their retarded child, their desire to keep the trainable child in the home is strengthened, for they think, as Boggs (13) states, that many of these children could make an adequate adjustment in the home and local community if proper training were given them. Some organized groups of parents of mentally retarded children have formed and now operate classes designed to provide such a program of training. They also have been successful in securing such programs of training in many public schools. Rothstein (31) states that the organized groups of parents of mentally retarded children have exerted pressure on school systems and legislatures since approximately 1951 to develop public day school programs for the trainable child. Such organized pressure has brought about two facilities for this type of child in addition to residential schools, which existed prior to such pressure. These facilities are: (1) segregated community centers and (2) public school classes.

There remains, however, the unanswered question as to the type of environment most advantageous for the training of the trainable child. Would this type of child make more progress by living at home and attending classes in the public schools; by living at home and attending classes provided in community facilities which are segregated, such as those provided by parent groups; or would the environment provided in an institution for the mentally retarded be more profitable for this child?

B. Definitions

1. Mental Retardation

Doll (17) defines mental retardation (deficiency) as follows:

> Mental deficiency is a state of social incompetence obtaining at maturity, or likely to obtain at maturity, resulting from developmental mental arrest of constitutional (hereditary or acquired) origin; the condition is essentially incurable through treatment and unremediable through training except as treatment and training instill habits which superficially compensate for the limitations of the person so affected while under favorable circumstances and for more or less limited periods of time. (p. 217)

2. Trainable Mentally Retarded

So many terms have been applied to children with low intellectual ability that much confusion exists concerning terminology. It is necessary, therefore, to define the term "trainable mentally retarded."

The (Illinois) Curriculum Guide for Teachers of Trainable Mentally Handicapped Children (37) describes this child in a comprehensive manner as follows:

> Trainable mentally handicapped [retarded] children are those who develop at such a slow rate that they are unable to profit from the program of instruction for the educable mentally handicapped, but they have potentialities for (1) developing the abilities to adjust acceptably to the home and neighborhood, (2) improving in their ability to care for themselves in many respects, and (3) contributing to their own economic usefulness in the school, in the home, and in a residential school or in a sheltered environment. . . .(p. 3)
>
> Their mental development is approximately one-quarter to one-half that of the average child. . . .
>
> Their speech and language abilities are distinctly limited but they are able to make their wants known. . . .
>
> They are generally not capable of learning academic skills such as reading and arithmetic beyond the rote learning of some words or simple numbers. . . . (p. 4)

Hafemeister (22) describes this child in the following manner:

> [The term] trainable children is meant to include that group of children in the chronological age range of 5 through 19 who cannot profit from an academic type of school program but who can respond to specialized training largely through habit conditioning and through performance and manipulative types of activities. They can be trained to satisfactorily perform routine non-academic type of activities but they will require constant supervision and domiciliary type of care. (p. 495)

In terms of intelligence quotient, Kirk and Johnson (6) rate the trainable mentally retarded between 20 or 25 and 40 or 50 on intelligence tests. Doll (36) states that, at maturity, the intelligence quotient of this group will be below 50 and their mental ages below eight years.

For the purpose of this investigation, the trainable mentally retarded child is defined as that child whose intelligence quotient is approximately 25 to 50, inclusive, and whose mental age, at maturity, will not exceed eight years. The terms used to refer to this child are the "trainable mentally retarded child" or the "trainable child."

3. Educable Mentally Retarded

Ingram (5) describes the educable mentally retarded in the following manner:

> About 2 per cent of the school population have definite mental limitations so extreme that their failure to succeed in school with average children is conspicuous. These children require a special program for mental, social, and emotional education if they are to become self-supporting. . . .
>
> The intelligence quotient range from 50 to 75 is the approximate range most widely accepted. (pp. 5-6)

4. Curriculum

For many years the traditional concept of curriculum included only academic subjects. One of the first laws pertaining to the curriculum was that established in Massachusetts in 1647 authorizing a curriculum of reading and writing. Today the modern educators, as Otto (8) points out, consider the curriculum to consist of the sum total of educative experiences of children during their "sojourn" in the educational system. It may be considered a vehicle through which children may achieve the objectives of education.

It is the latter concept of curriculum that is implied in the use of the term "curriculum" in this present study. It is considered a vehicle through which the trainable child might achieve the objectives of the training program.

5. Social Adjustment

For the trainable child, social adjustment in this curriculum does not refer to an isolated skill taught through isolated activities, but refers to a result of many activities, as pointed out in the (Illinois) Curriculum Guide for Teachers of Trainable Mentally Handicapped Children (37). Participation in his environment and the acceptance of responsibility in that environment adequate for the mental level of the trainable child are the chief areas designated under social adjustment.

6. Self Care

In this curriculum, self care refers to those tasks of caring for personal needs, such as grooming, the personal routine of dressing, eating, and developing certain safety routines.

7. Economic Usefulness

In this curriculum, economic usefulness refers to those tasks which were designed to provide an opportunity for the trainable child to gain independence in helping himself and others. Examples of these tasks are: washing dishes, dusting, and caring for his rest mat.

C. Etiological Aspects

A medical classification of mental retardation is based chiefly on etiological criteria; for example, the mental retardates are grouped according to the cause of the condition. According to Jervis (25), such a classification may offer difficulty in individual cases because often etiological data are incomplete or contradictory and more than one etiological factor may be responsible for the condition. In spite of this difficulty, however, the etiological classification of Jervis is discussed since it is perhaps the most adequate for the purposes of this research.

According to Jervis (25), mental retardation can be divided into two large etiological classes: (1) exogenous or secondary (causes from without) and (2) endogenous or primary (causes from within; inherited). Accordingly, the following classification is given:

A. Exogenous mental defect
  - (1) Due to infection
    - (a) Intrauterine. . .
    - (b) Postnatal. . .
  - (2) Due to trauma
    - (a) Birth trauma. . .
    - (b) Prenatal trauma. . .
    - (c) Postnatal trauma. . .

- (3) Due to toxic agents
    - (a) Chemical agents--accidental poisoning. . .
    - (b) Physical agents. . .
    - (c) Incompatible blood factors. . .
    - (d) Undetermined toxic factors. . .
- (4) Due to endocrine disorders. . .
- (5) Due to emotional factors or deprivation. . .

B. Endogenous mental defect
- (1) Due to multiple genes. . .
- (2) Due to single recessive gene. . .
- (3) Due to single dominant gene. . .
- (4) Due to undetermined genetic mechanisms. . . . (p. 176)

D. Incidence

For the purpose of this study, perhaps the most adequate estimate of incidence of trainable children has been made by Goldberg (19). From a survey of studies, he estimates that the prevalence of school-age trainable children in the United States is at least 0.3 per cent and probably no more than 0.4 per cent. He states that the total school-age population as of the fall of 1956 was about 32,000,000. Thus, the estimated trainable mentally retarded in the United States as of fall, 1956, was between 95,000 and 130,000.

E. Problem

This investigation was designed to be a systematic study of a selected population. The purposes of this study were: (1) to make a comparative investigation of the progress of the trainable child in certain areas of training in public school facilities, segregated community center, and state residential centers; (2) to investigate whether one of the above environments proved to be more adequate than the other two for the training and development of the trainable mentally retarded child; and (3) to investigate the assumption that such children who participate in an organized training program develop their potential ability more adequately than those who do not receive such training.

F. Significance of the Study

A survey of the literature failed to reveal any previous comparative study of the progress of the trainable child in an institutional setting, a public school environment, and in a segregated community center. It is desired that this investigation indicate whether one of these environments is more adequate for the training and development of this type child.

As previously stated, there is apparent conflict in the present thinking of professional people in regard to the placement of the program and the training of the trainable child. The information obtained from this investigation may be helpful in developing significant solutions to some of these conflicts. Some of the specific and significant ways in which the results of this study may be used are listed below.

1. The results of this study should furnish guidelines for thinking and planning in regard to the expansion of institutional facilities

as such expansion relates to providing training for the trainable child.

2. The investigation should furnish experimental evidence to be used by persons planning segregated facilities for the training program for this type of child, such as segregated classes operated by the parent groups; or segregated classes under the administration of the public schools; or, as Cruickshank (16) points out, segregated facilities in the local community under the administration of the agency charged with the life-time supervision of the mentally retarded.

3. Cruickshank (16) states that state legislation authorizing the public schools to establish training programs for the trainable child often is brought about by parent pressure. The results of this study should provide objective data which might be used as guidelines for future legislative action relating to the placement of the training program for the trainable child.

4. The results of this study should give educators objective guidelines for their thinking about including such programs as part of the public schools. Also, it should furnish information concerning the acceptance of the trainable child by the so-called "normal" child and the school staff in the public schools.

5. Lieberman (26) points out that where superintendents of school districts have been requested to establish a program for the

trainable child, they have been without workable and practical ideas to apply in initiating such a training program because such a program is non-academic and requires different methods from those already established for the mildly or educable retarded. The methods and techniques developed as part of the present research should be of value as guides in establishing a training program for the trainable child, whether such a program is located in the public schools, in an institution for mentally retarded, or in local segregated environments.

6. The research population consisted of three experimental groups, who received training under the direction of competent teachers in the research project, and one control group, who did not receive training under competent teachers during the period of the research. The comparison of the progress of these two groups should provide objective data pertaining to the effectiveness of training programs for the trainable child.

G. Hypotheses to be Tested

This investigation was designed to test hypotheses pertaining to the progress in certain areas of training of the research population. The areas of training were social adjustment, self care, language development, physical development, music, arts and crafts, and economic usefulness. The hypotheses are given below.

1. It is predicted that significant differences will be found between the progress of trainable mentally retarded children when compared according to their environmental groupings. These predicted differences are listed below.

   a. The progress of subjects attending special classes in the public schools is greater than that of trainable mentally retarded children attending similar classes maintained by community agencies or classes in residential schools.

   b. The subjects who live at home and attend special classes maintained by the public schools and by community agencies make greater progress than do those who live in a residential school and receive training in classes at that school.

   c. The progress of the subjects who receive training in special classes under the direction of competent teachers is greater than that of those living at home and receiving no formal training.

2. It is predicted that no significant differences will be found in the level of progress of trainable children when the following comparisons are made:

   a. Mongoloid vs. non-mongoloid

   b. Neurological involvement vs. no neurological involvement

c. Hyperactive vs. non-hyperactive

d. Physical handicap vs. no physical handicap

e. Language handicap vs. no language handicap

H. The Historical Background

1. The Early European Influence

Among the first recorded studies of the retarded child was that done by Jean Marc Gaspard Itard. According to Boyd (2), in 1798 an eleven- or twelve-year-old "wild" boy was found roaming the woods of France in search of food. He was brought to the Academy of Science in Paris where Philippe Pinel pronounced the boy an incurable idiot who could not profit from education. Itard, who was then physician at the Institution for Deaf-Mutes in Paris, explained the apparent idiocy of the boy by the fact that he had always lived outside of society and had never had his faculties trained. He, therefore, initiated a program of training for the boy to demonstrate the educability of an idiot through the training of the senses. After five years, Itard dismissed his pupil as a failure because he developed into a youth of uncontrollable temper who would not cooperate in the program of training. Itard felt that he had failed in his task; however, Wallin (11) points out that the French Academy of Science commended Itard's work and recognized that he had made a positive contribution to educational science.

Wallin (11) further states that Seguin, who was a pupil of Itard, modified, systematized, and elaborated Itard's method for use in the training of the retarded. Seguin devoted 42 years of his life to the study and training of the retarded, first as a teacher and then as a physician and psychologist; and, according to Wirtz (35), as early as 1844 his work was acclaimed throughout Europe. Seguin came to the United States in 1848 where he served as an advisor to many of the early institutions which were being established and which widely used his philosophy and methods in developing their training plans.

According to Kirk and Johnson (6), Maria Montessori, of Italy, became interested in the mentally retarded in about 1897. After studying the work of Itard and Seguin, she concluded that the problem of mental retardation was primarily a pedagogical one rather than a problem of medicine as it had been considered previously. Advocating this point of view, she organized the Orthrophrenic School for the Cure of the Feebleminded. In this school, which she conducted personally, she not only educated the mentally retarded, but also conducted a training center for teachers of mentally retarded children. Stevens (33) points out that "didactic materials" developed by Montessori in her work have strongly influenced special education.

2. The Development of Institutions

Wirtz (35) states that in 1842-43, before Seguin came to the United States, Horace Mann and George Sumner, after observing Seguin's work, became enthusiastic about his teaching methods. Their enthusiasm attracted Hervey B. Wilbur, of Massachusetts, who obtained Seguin's books, and after a period of study, opened his home in Barre, Massachusetts, in July, 1848, as the first private school in this country for the education of "idiots."

Wirtz (35) reports that the first attempt to establish a public institution for the mentally retarded in this country was made in New York State in 1846, but this effort was defeated in the New York Legislature. At that time, the Massachusetts Legislature conducted a study of the condition of mental retardates in that state. As a result of that investigation, a public institution for mental retardates was established on October 1, 1848, which was the first state institution for the mentally retarded to be established in the United States. That institution now operates as the Walter E. Fernald School.

New York, according to Wallin (11), was the second state to establish an institution for the mentally retarded. The New York school was opened in Albany in October, 1851. The third state to follow was Pennsylvania, where a private school was established which later became the Elwyn Training School. Two other states, Ohio and Connecticut, established schools for the mentally retarded around the middle of the century. The school in Connecticut, however, was supported by private donations, fees, and small state grants for many years. Records of the early institutions in this country indicate that both private and state interests were stimulated to provide training for the mentally retarded individuals.

Wallin (11) further states that in 1955 every state except two supported residential schools, institutions, or colonies for the shelter, education and employment of mentally retarded children and adults. The exceptions were in Arkansas, which housed some cases in state hospitals, and Nevada, which also provided for some mentally retarded individuals in the Nevada Hospital for Mental Diseases.

Wirtz (35) points out that there has been a steady increase in the population of institutions since 1904. In fact, the population of institutions approximately tripled from 1923 to 1950, as shown by the increase from 46,580 persons in 1923 to 134,189 persons in 1950. Wirtz (35) further states that the proportional increase in institutional population has been relatively greater than the proportional increase in the population of the country as a whole. In spite of the rapid growth of institutions, they are still overcrowded. For example, Illinois, according to Wirtz, had two institutions which in May, 1954, had a capacity of 6,813 and a resident population of 10,085. Most institutions have waiting lists which result in a certain number of mentally retarded individuals remaining in the community for whom institutional placement has been indicated and for whom no provisions have been made.

3. The Development of Public School Facilities

Commins and Fagin (3) point out that Binet and Simon published their first individual intelligence test in France in 1905. It was revised in 1908 and again in 1911. Lewis M. Terman standardized this test on American children in 1916 and again in 1937. Stevens (33) states that the development of intelligence testing affected the growth of American institutions for the mentally retarded, as it was through intelligence testing that psychologists discovered thousands of mentally retarded individuals.

Stevens (33) further points out that in addition to the fact that intelligence was now measured with reasonable accuracy, other forces were working which served to focus attention upon the need of education for the mentally retarded. Around the turn of the century, the country was beginning to enjoy the benefits created by the mechanization of its industry. The demand for child labor lessened, thus pressures were brought to bear to keep children in school. Compulsory school attendance laws began to be passed, and schools began to feel the impact of new problems of "laggards" in the schools.

According to Wirtz (35), it was not until half a century after the first public institution for the mentally retarded was activated that the first public school class for them was organized. In 1894, a special school was started in Providence, Rhode Island, for "problem children." Two years later a class was organized in this school to care for the mentally retarded in the "problem" group. Apparently, this Providence class was the first of its kind to be organized in public schools in this country. The dates on which other classes were organized are rather uncertain; however, apparently the next was organized in Springfield, Massachusetts, in 1897. Following this was Chicago in 1898, Boston and New York in 1899, Philadelphia in 1901, and Los Angeles in 1902. Most of the larger cities organized classes for the educable mentally retarded rather rapidly after this time. About four and one-half times as many mentally retarded children were being educated in special classes in 1954 as in 1922.

Baker (1) reports that there were only a small number of trainable children in the early classes for the mentally retarded. Most of the retardates of the trainable level were excluded as their training required a non-academic program. The parents of such children, however, believed that these classes were established for their special benefit and insisted upon their rights as taxpayers. According to Wirtz (35), many of these parents exerted pressure on school administrators to provide a place for their children and, no doubt, parents with such motivations formed the nuclei for the parent groups. In many cities there are now a limited number of classes for the trainable child which offer a non-academic program of training.

4. The Development of the Parent Movement

As has been pointed out previously, in an effort to provide training primarily for the trainable child, parents are presently establishing schools of their own and operating them privately. Wirtz (35), however, believes that the parent groups, in working to provide training for the trainable child, generally seek facilities within the framework of the public schools. In 1953, the Board of Directors of the National Association for Retarded Children (27), the national organization of parents, adopted the following "Bill of Rights" for their retarded children:

> 1. Every child, including every retarded child, is important and has the right to opportunities for the fullest realizations of his potentialities, however limited, for physical, mental, emotional, and spiritual growth.
>
> 2. Every child, including every retarded child, has the right to affection and understanding from those responsible for his care and guidance during his years of dependence.
>
> 3. Every American child, including every retarded child, has the right to a program of education and training suited to his particular needs and carried forward in the environment most favorable for him, whether that be the community public school, the state residential school, or his own home.

> 4. Every American child, including every retarded child, has the right to help, stimulation and guidance from skilled teachers, provided by his community and state as a part of a broadly conceived program of free public education.
>
> 5. The parent of every child. including every retarded child, has the right to determine for themselves, on the basis of competent advice, the course of care, training, and treatment, among those open to them, which they believe best for the well being of their particular child and family--and to have their decision respected by others. (p. 516)

The general trend of thinking by parents of trainable mentally retarded children seems to be reflected in the following statement by Boggs (13):

> . . . There is a growing conviction that many of them [trainable mentally retarded children] can remain in the community indefinitely, or at least as long as their parents are able to supervise them, provided a suitable training program is available locally to enable them to become acceptable members of their families and neighborhoods. (p. 357)

CHAPTER II

SURVEY OF THE LITERATURE

The literature indicates that various methods have been used in an effort to provide training for the trainable child. One of the earlier programs of training for this type of child outside of an institution was a home training program. Nugent (29) reports that such a program was established in 1937 by the Director of the Division of Mental Deficiency of the Department of Mental Health in Boston, for those children of low mental ages who had remained in their homes and had been excluded from school because of their low mental ability. This program consisted essentially of the "training of the senses," developing better muscular coordination, and teaching routine and discipline by means of organized play. A kindergarten and pre-kindergarten program was provided for those children who could profit from such training. The type of training program needed by each child was determined through information secured in home visits by a social worker and by psychological examinations. The teaching materials and teaching instructions were provided by the Division of Mental Deficiency. A social worker instructed the parent in using the teaching methods and materials, and the parent carried on the program for the child.

Nugent (29) reports that because of the parents' better understanding of the child's mental capacity, which they received through their participation in this program, and the child's improved adjustment in the home and community brought about through the training, institutional placement was postponed in many cases.

Cianci (14) reports on a similar program in New Jersey which, under the direction of the Division of Classification and Education of the State Department of Institutions and Agencies, was established in 1943 for those children whose names were on the waiting lists for institutional placement. Eighty per cent of these children were reported to be of the idiot [custodial] or imbecile [trainable] level. The training program placed emphasis on elementary habit training, emotional control, self help, speech, and play activities designed to develop muscular coordination. The parent taught the child on the basis of instruction and materials provided by a home teacher. After the program had been in progress three years, a study revealed that the number of parents desiring institutionalization for their children was significantly decreased.

According to Farrell, Brazier, and Shea (18), day classes for the trainable mentally retarded children were started at the Walter E. Fernald School in 1945. The instruction was essentially "sense training" and habit training, and kindergarten training was offered to those who could profit by such a program The authors reported that after the classes were in operation for two years, the staff concluded that the classes not only proved workable, but also filled a real community need through a method previously untried.

Ingram and Popp (24) report that the public schools of Flint, Michigan, established a program for the trainable mentally retarded child during the 1953-54 school year. The training program emphasized self care, physical development, social relations, and speech. Most of the children in the program showed satisfactory progress in the different areas of training during the first year in a class. The establishment of the training program, however, was preceded in 1952-53 by a class for the parents of such children, which was designed to provide some understanding of the causes of retardation, the basic needs of the child, emotional control and handling of this type of child, and to give a better understanding of the community resources for these children, including institutional care. When the classes were opened, each teacher was given time to visit and work with the parents. In view of the increased parental understanding of this type of child and their cooperation and support of the program of training, the school staff of Flint recommended working with the parents as well as with the child.

Baumgartner (12) reports that the Department of Public Instruction of the State of Illinois, authorized by the State Legislature, conducted a two-year study from 1953 to 1955 of classes for the trainable mentally retarded children. The study included 198 children enrolled in 22 classes distributed through 12 school districts in the state. The training program included the following areas: social adjustment, self care, economic usefulness, physical development, language development, music, and arts and crafts. As a result of this study, permissive legislation, which made the establishing of classes optional, was passed for permanent programs for the trainable child in the public schools.

Purcell (30) reports that Ohio delegated the responsibility for the training of the trainable mentally retarded child to the Division of Mental Hygiene within the Department of Public Welfare. The training program was non-academic, stressing primarily socialization, self care, and the mental health of the child and the parent. The program was a county program designed to be operated in the Community Training Centers. In 1955, there were 95 classes in Ohio located in 33 of the 88 counties. Forty-nine of the classes were approved and received state funds; however, more of the classes would have been approved had there been more state money provided. Twenty-six of the 49 classes approved were housed in public school buildings, which ussually meant the public school furnished heat, light, water, and janitorial services. In some instances, supervision of and financial assistance for such classes were provided by the public schools. A State Attorney General's opinion gave authority to the school to participate and spend money for such programs. Purcell (30) points out that Ohio's program was a cooperative program, but the responsibility for the program was delegated by law to the Division of Mental Hygiene within the Department of Public Welfare.

Schwarz (32) reports that special schools for physically and handicapped mentally retarded children were established in Milan, Italy. In 1951, experimental classes for trainable children, who were classified as mongoloids, were formed in these schools. Each class had a carefully selected group of 10 children between 8 and 13 years of age who previously had received some kind of training at home or in a school. The training stressed socialization, acquisition of practical skills, speech training, physical development, and care of personal needs. As a result of this first class, other classes were established later for younger children without requiring them to have had previous school experience or training.

According to Neuhaus (28), an experimental class for trainable mentally retarded children was conducted during the 1955-56 school year by the Nassau County (Long Island) Chapter of the Help for Retarded Children. The training was basically geared to teaching the child to care for his personal needs, to improve muscular coordination, to respond to and follow directions, and to learn to play and work with others. As a result of the progress made by the children in this experimental class and the increased parental understanding of their trainable child, additional classes were established by the group. Such classes are typical of many being established by parent groups.

The studies reviewed suggest that numerous methods and environments have been used in providing training for the trainable mentally retarded child. There are, however, as previously stated, differences in the thinking relating to the most profitable environment for this program. These differences may be due largely to the fact that the needs of these children differ significantly from those of the mentally retarded children who are educable. Lieberman (26) points out that the goals and objectives for a program of training for the trainable child ought to be social development rather than social adequacy, and comfort in an economic system rather than economic competency.

Wirtz (35), as was mentioned previously, briefly states the controversy regarding this program. Generally, programs which are not academic in nature have not been viewed by school administrators as a legitimate function of public schools. Some school officials think that conducting non-academic programs for trainable mentally retarded children should be the responsibility of the staffs of the institutions for mentally retarded through the utilization of the facilities in the institutions which have been established for that purpose or in some outpatient center under their direction. The staffs of the institutions for mentally retarded, however, contend that since such institutions are already overcrowded, and since many institutions do not have adequate staff to carry on the present programs, it would be impossible to care for all the mental retardates in need of service. Wirtz (35) further states that it appears that there is more pressure being placed on public schools to start training programs than is being applied to the staffs of the institutions for the mentally retarded to expand facilities essentially institutional in nature. While the controversy between public schools and the staffs of the institutions for mentally retarded has been going on, parents have been starting private schools. The parent groups have now become a potent force in the controversy, generally seeking facilities within the framework of the public schools.

In the "Bill of Rights" adopted by the National Association for Retarded Children (27), the parent group states that they believe every retarded child has a right to a program of education or training suited to his needs. Furthermore, they state that this program should be conducted in the environment most favorable for his development, whether that be in the public school, in the state institution, or in his home.

Hudson (23), supporting the viewpoint that trainable children should be included in the public schools, states that mentally retarded children have been divided into two groups for "school" purposes: (1) those who are "educable," and (2) those who are "trainable." She states that the difference between the two groups is in the fact that the educable child can be educated in special classes in public schools, and the trainable child must be considered as a custodial case who would not profit from educational procedures.

Hudson (23) further remarks that today education often is defined on a utilitarian basis which states the goal of education as an absolute goal of self-sufficiency. This goal of self-sufficiency implies that all products of the educational system will reach a minimal adult level of skill in the academic areas. The school program today, however, also emphasizes things that lead to a well-rounded and well-adjusted individual. She points out that the mentally retarded child, including the trainable child, needs this education presented at his level of functioning to enable him to adjust adequately to his environment.

Hudson (23) further points out that the doctrine of individual differences, to which many educators subscribe, not only emphasizes that all who can profit from an education are entitled to it, but that all children are entitled to an education to the limit of their capacities. She says that on this premise, the problem of the education of the trainable mentally retarded child becomes a problem of adapting education to the capacities of this type of child rather than ignoring his need for education.

Hudson (23) concludes that as long as it can be shown that the trainable mentally retarded child can learn, and that there are ways of teaching him, the public schools have an obligation to provide the opportunity for his learning. She contends that it does not matter whether the child is ultimately destined to live in a residential school for mentally retarded or at home, he still needs the kind of education that will make him a "dependable, self-respecting citizen of the society in which he lives." (p. 586)

Goldberg (20) points out that there is a growing recognition that trainable mentally retarded children are individuals with potentialities that deserve to be developed. This is evidenced by the number of schools providing training for the trainable mentally retarded at the present time. Their program of education is different from that of the so-called "normal" or educable mentally retarded child because it is essentially training in self care, language and physical development, economic usefulness, and other activities contributing to social adjustment.

Goldberg (20) further remarks that there is no agency in our society better equipped to assume leadership in providing a program of education for the trainable child than the public schools; also that there is no other agency which is better qualified to initiate and conduct parent-education programs, educational research, and curriculum development, or to regulate professional standards of teachers who will work with trainable children. Goldberg concludes that it is the responsibility of the public schools to extend its present programs and, through a concentrated effort over a period of years, to decide what contribution it can make to the growth and welfare of trainable children.

In relation to placing the trainable child in the public schools, Cruickshank (16) states that the concept of public education and the public day school implies that, as a result of learning, the individual will be able to assume a self-directed role in society maintaining a position of personal independence and even assuming the responsibility for others; for example, as a husband or wife, or as parents; and also that he will participate in civic matters, thus returning something tangible or intangible to the state. Cruickshank contends that this concept is completely unobtainable by the trainable mentally retarded individual because he requires supervision throughout his life. If public education is to assume the responsibility for the trainable mentally retarded, then public education must become a life-span operation. If the upper age limits of public education are not extended, then at 16, 18, or 21 years of age the trainable mentally retarded, in most instances, will become the responsibility of the agency in the state which can assume such life-span supervision. He points out that parents have the right to keep their trainable child in the home and are entitled to training for such a child. Since, however, it is debatable that the concept of education, as previously stated, will be obtained by the trainable child, and since the public day school in all probability will not assume life-span supervision of this child, he asks if it is not more appropriate to consider the training of this type of child as the responsibility of the agency within a given state which has been delegated this life-span responsibility.

Cruickshank (16) further states that when legislators advocate the extension of public day school provisions to the trainable mentally retarded child, they are doing one of several things. First, they are responding to the pressures of a given segment of society and are taking one way out of a complex political problem. Second, they are accepting, without any real thought, the often-heard statements that "In a democracy every man can be a king," and that "The door of education should be open to all." This implies that in opening the door the individual can meet the minimum requisites for education. Third, they are enacting laws which bring the concept of custody, primitive habit formation, and lifetime supervision into education, a fact which has never existed previously in the literature to this time.

Tudyman (34) points out that a program for the trainable mentally retarded in the public schools should be based on the fact that there is a place in the public school system for it. It should not be placed in the public school on expediency alone because many state institutions are overcrowded and have long waiting lists, nor should it be included as a sentimental gesture to parents of such children. He further states that a careful study ought to be made by the public school system in terms of worthiness, prudence, and desirable outcomes of such classes within the system, as such a study might indicate that other facilities would be more feasible and even more desirable for this type of child.

CHAPTER III

PROCEDURE

A. Introduction

This study was concerned with a training program for trainable mentally retarded children in three experimental classes. The classes were conducted for two nine-month school terms during the period from September, 1957, to June, 1959. One class was located at Wooldridge Elementary Public School, Austin, Texas; another at the Opportunity Center, a center operated by the Austin Council for Retarded Children; and the third class was located at the Austin State School. There also was a control group, the members of which lived at home with their parents in Houston and San Antonio, Texas, and did not participate in an organized class of training.

B. Environments

The room which was occupied by the experimental class at Wooldridge School was equipped with primary desks and chairs and had adequate space for supplies and closet space for the children's wraps. There was water available at drinking fountains just outside the room, and rest rooms, which also were used by the other children, were only a few feet away. There was no outside play equipment nor any play area which was enclosed completely.

The room occupied at the Opportunity Center was equipped with primary chairs and tables, had adequate space for supplies and for the children's wraps, and had a drinking fountain in it. There was an adjoining rest room, and an outside enclosed play area with adequate play equipment.

The classroom at the State School was equipped with one large round table which was open in the middle, thus enabling the teacher to work from the inside as well as from the outside of the table. There was adequate storage space for supplies and for the children's wraps. Rest room facilities, which the other school children also used, were only a few feet away, and a drinking fountain was in the hall near the room. There was outside play equipment and a play area.

The permanent equipment in each of the above rooms was furnished by the respective facility. The research project, however, furnished identical teaching aids and materials to each group.

C. Population

The study population consisted of thirty trainable mentally retarded children whose range of chronological ages at the beginning of the study was from approximately 6 years to 12 years. The mental ages were below 6 years at the beginning of the study, and the range of I.Q.'s was from approximately 25 to 50.

The population for the classes at Wooldridge School and the Opportunity Center was chosen from the Austin area. Referrals were received from the Austin Public Schools, the Austin Council for Retarded Children, and other sources through which knowledge was available as to children who might qualify for this study. The parents of such children were contacted to determine whether they desired to have their child participate in the research program.

The children in the class at the State School were selected on a random basis from the group of trainable children of the resident population of that school. The Councils for Retarded Children at Houston and at San Antonio, Texas, were contacted for the name of parents whose trainable mentally retarded children would not receive training in an organized program during the two-year period of the research. Such parents were contacted to determine whether they desired to have their children participate in the study as part of the control group.

D. Baseline Information

A visit was made into the home of each child, including that of each child in the control group, to secure data pertaining to the physical and social history of the child concerned and to allow for observation, insofar as possible, of the child's behavior. Such a visit could not be made into the homes of the children of the State School group.

The parents of those children in the classes at Wooldridge School, the Opportunity Center, and the control group came to the office of the research project where physical and social histories were obtained. Similar information as available was secured from the files of the State School on the children in that population.

A psychological evaluation was obtained, if the information secured from the two above-mentioned sources indicated that the child was trainable mentally retarded, that he was toilet trained, and that his behavior and physical capabilities permitted him to participate in group situations. The same psychologist made all the evaluations. His evaluations of the children was his only service to the research. These psychological evaluations were based upon the Stanford-Binet Intelligence Scale; the Vineland Social Maturity Scale; observation and interpretation of free drawings; the psychologist's evaluation of sensory responses, speech ability and coordination; and the psychologist's overall clinical evaluation of the child in the testing period.

Medical evaluations were made on each child, including those in the control group, if the results of the psychological evaluation indicated that the child were eligible for the study. Medical evaluations included a pediatric examination; neurological examination, including an electroencephalogram; laboratory tests, including a urinalysis and blood serology; and an eye-ear-nose-and-throat examination. The eye-ear-nose-and-throat examination and the psychological evaluation were repeated at the end of the research period. This information is not included, as it was not considered pertinent to this study.

E. Assignment of Children and Teachers

The population was distributed between the classes at Wooldridge School and the Opportunity Center in order to equate the groups, insofar as possible, as to chronological age, mental age, and intelligence quotient. The group at the State School was chosen on the basis of equating that group with the other two groups.

The teacher at the State School was assigned to the project by her principal for the two-year study period, remaining on their administrative payroll, since she was already employed there. The teachers at the public school and at the Opportunity Center were added to the project staff. All three teachers had previous experience as teachers of trainable children. It was not possible to rotate the teachers among the experimental groups as a means of equalizing teacher influence on each group; therefore, the investigator observed the teaching procedures of each teacher and worked closely with each in a supervisory capacity in order to help equalize the teaching between the groups.

In addition to the control afforded by the above procedure, each teaching situation was described by three different observers according to the Descriptive Schedules developed by Sanders (9). Sanders designed five schedules which described facets of the classroom procedures: Schedule B--Provision for Individual Differences; Schedule C--Curriculum Organization and Teaching Techniques; Schedule D--Social Organization and Classroom Psychological Climate; Schedule E--Efficiency and Orderliness of Classroom Activities; and Schedule F--Order Maintaining Techniques. Each schedule had five levels which described classroom procedures. The schedules were designed on the assumption that level one was the least desirable classroom procedure and that each level thereafter was more desirable, with level five being the most desirable. In an interview with Sanders, he pointed out that the classroom procedures which the current educational literature set forth as the most effective were used as the criteria for designing the schedules and their respective levels. Schedule C was omitted in the evaluation of the teaching situations of the present research as the curriculum organization and the teaching techniques as described were not pertinent to a controlled teaching situation such as that of this research. In addition, it was necessary to make certain changes in the four schedules which were used in order to adapt them for evaluation of a teaching situation for trainable children.

F. Curriculum

The seven areas of the (Illinois) Curriculum Guide for Teachers of Trainable Mentally Handicapped Children (37) was used in developing the training program. These areas were as follows: social adjustment, self care, language development, physical development, music, arts and crafts, and economic usefulness.

During the first four months of the research period, the teachers experimented with tasks and activities suitable to the level of learning for the trainable child. During this period, the teachers met at least two afternoons a week for one to three hours for discussion and coordination of teaching plans and methods. In January, 1958, it was decided that sufficient experimentation with activities had been conducted to develop lesson plans and teaching methods which each teacher could follow and which also would afford greater control of the curriculum.

The teachers continued to meet with the investigator one or two afternoons a week, as determined by the need, for a period of one to three hours, during which time the lesson plans were developed as follows:

1. Activities or tasks were designed to develop skills or abilities within each area of the curriculum. For example, rest periods were designed through which care of rest mats was taught, and the juice period was designed through which drinking, serving, and washing and drying dishes were taught. Such tasks were classified under the area of economic usefulness.

2. The methods of teaching each activity or task were developed so that each teacher could use essentially the same method of teaching the different tasks or activities.

3. The materials to be used in the teaching of each task or activity were agreed upon in order that the teachers could use the same materials in the various tasks or activities.

4. Lesson plans were developed which were designed to include every task or activity. The lesson plan to be used for each day in the month was determined on a monthly basis, and then these plans were further developed on a weekly basis. The lesson plans specified the activity to be taught, the time at which it was to be taught, and the method and materials to be used. Adjustments in the lesson plans or teaching methods were permitted in order to care for the individual needs of the children. If deviations from the lesson plans or teaching methods were made, the reason for the deviation and the substitution used were recorded. The substitutions used were to be activities

which covered the same area of training as the activity for which the substitution was made.

An important control of the curriculum was the fact that the teachers and the investigator worked very closely in all phases of the research pertinent to their role. They discussed and unified, insofar as possible, their ideas about teaching, discipline, the development and progress of the children, as well as problems relating to particular children. Sample pages from the curriculum and lesson plans are presented in the Appendix.

In addition to the controls of the curriculum being developed through the meetings with the teachers, the investigator observed the teaching procedures and teaching schedules of each teacher and worked with her toward equalizing the teaching and curriculum between the groups. This same investigator studied with each teacher the progress and behavior of the children in the teacher's group, as well as the methods of teaching and handling the group.

G. Rating Techniques

A rating scale was constructed to measure individual progress in the various skills and abilities within each of the seven areas of the curriculum. The scale for each skill or ability had five levels of achievement designed to measure progress. The fifth level was designed to describe the least desirable performance in the skill or ability, and each level thereafter described a more desirable performance, with the first level designed to describe the most desirable performance in the skill or ability. There were 53 scales, 10 of which were in the area of social adjustment, nine in the area of self care, nine in language development, eight in physical development, six in arts and crafts, four in music, and seven in the area of economic usefulness. A few of the scales were designed to measure more than one skill or ability; for example, one scale under physical development, gross muscle activities, measured the ability to walk, march, and run. Sample pages from the rating scale are presented in the Appendix.

According to Coombs (15), in order for a scale of this type to be a true rating scale, three assumptions must be made in designing it. The first assumption is that the statements of the rating scale describe the general area desired. For example, the levels under the scale of social adjustment, accepting responsibility, are actually descriptive of characteristics of the behavior being judged. The second assumption is that the levels of the rating scale represent successive levels; that is, the behavior described in the fourth level is more desirable (higher) than the behavior described in the fifth level. Expressed in terms of levels, the assumption is $1>2>3>4>5$. The third assumption is that there are interval measurements of the variable involved. Coombs (15) refers to this kind of scale as an "ordered metric scale."

Each child in the experimental group was rated by the investigator and the child's teacher at approximately the middle part of the following months: September, 1957; January, 1958; May, 1958; September, 1958; January, 1959; and May, 1959. Each child in the control group was rated against the same rating scales by a research assistant at approximately the middle part of the following months: January, 1958; September, 1958; and May, 1959. The first rating of the control group was made during January, 1958, as the control group was not stabilized until December, 1957.

It was recognized that the conventional control of "blind" ratings by disinterested, but trained, observers might have provided more objective ratings or experimental control. Such raters were not employed, however, because of the expense involved since the research was conducted on a limited budget. It was recognized, also, that more experimental control might have been gained had the ratings of progress of the experimental and control groups been made by the same individual. Because of the amount of work involved in making the ratings, in addition to the travel required to reach the members of the control population, it did not appear feasible for one individual to do the ratings for both groups. Both the investigator and the research assistant were students at the doctoral level at The University of Texas.

An analysis of trends, as described by Grant (21), was used to evaluate the progress in each of the areas of training of the children in the different experimental environments: the public school, the segregated community center, and the state school. A separate analysis of trends based upon the three ratings of the control group and the three corresponding ratings of the experimental group was used as the basis for the comparison of the progress of the two groups. The trend analyses also provided independent statistical tests of certain components of the learning curves for the groups.

The Mann-Whitney U Test (10) was used to compare the progress of the children in the experimental groups as classified according to different categories or subgroupings. For example, the progress of mongoloid trainable children was compared with the progress of those who were not mongoloid. The other categories by which the children were classified were: neurological involvement, observed hyperactivity, observed physical handicap, and observed language handicap.

The effectiveness of the class in the public school was further studied periodically by obtaining from the teachers and principal opinionaires relating to the acceptance of the class for trainable children by the school staff and by the so-called "normal" child attending the school. Opinionaires were obtained only from the staff of the public school because this was the only experimental environment where children other than those who were mentally retarded were housed.

CHAPTER IV

RESULTS AND DISCUSSION

The results of this study are to be presented in six sections: Section A, the data pertaining to the population; Section B, the data pertaining to the curriculum; Section C, the data pertaining to the observations of the teaching situations; Section D, the data pertaining to the opinionaires obtained from the staff of the public school in which one experimental group was housed; Section E, the data pertaining to the statistical treatment of the progress ratings; and Section F, the data pertaining to the findings of the progress ratings.

A. Population

1. The Population of the Groups

During the first two months of the research, September and October, 1957, changes were made in the experimental population. Three children were excluded from the public school class, Group A, two because of their inability to conform in any way to a group situation and one moved from the city. One was excluded from the group at the Opportunity Center, Group B, because of inability to conform. Three were excluded from the group at the State School, Group C, on a random basis of selection, in order to equalize the N of the three groups. In addition, one child was moved from Group B to Group A and three were added to the original population: two to Group B and one to Group A. At the end of this two-month period, the population was considered stable with each group having an N of nine.

During the period of the research, no children withdrew from Group A. Three children of the nine of Group B left the group. One child entered an institution at the end of the second rating period, January, 1958; one moved from the city during the summer of 1958; and one contracted tuberculosis during the spring, 1959. One child in Group C was excluded during the spring, 1959, because of rheumatic fever.

The population of the control group, Group D, was stabilized in November, 1957, with an N of eight. One child of this group, however, moved from the state after the first rating; therefore, she was excluded.

At the end of the period of the research Group A had an N of nine; Group B, six; Group C, eight; and the control group, seven. The total research population was 30. The original assignment of numbers to the subjects which was done after the population was stabilized was retained throughout the study. Those withdrawing were subject numbers 12, 14, 16, 25, and 29.

It was believed that the changes, as described above, were sufficient to invalidate the efforts to equate the groups which were made when the subjects were first assigned to groups. Because of the size of the sample, it is recognized that the results of the investigation indicated only trends.

2. Class Attendance for the Three Experimental Groups

Groups A and B followed the school calendar of the Austin Public School System, and Group C followed that of the State School. Thus, each class followed the same calendar for school attendance as the other classes housed in the same building. Each year during the period of the research, the calendar of the State School had five more possible days for attendance than did the public school calendar.

A percentage based upon the ratio of days in attendance to the possible days for attendance for those children who remained in the population throughout the study was computed for each group. The average attendance for the two-year period for Group A was 77 per cent; for Group B, 65 per cent; and for Group C, 74 per cent.

It was believed that the chief cause for absenteeism in Groups A and B was lack of transportation. The second cause was believed to be illness. Transportation for the children was not provided in the original plans for the study. Two children in Group A and three in Group B lacked transportation.

The degree to which attendance affected the average over-all performance of each group was not known. It was believed, however, that the average performance for a group during the two-year period was not changed significantly by this factor.

3. Subjects Classified According to Various Categories

The experimental population was classified according to five criteria in order to compare the progress of various categories of trainable children. The medical examinations distinguished those children who were mongoloid from those who were not mongoloid, and those with neurological involvements from those without neurological involvement. Five observers classified them on the following non-medical bases: observed hyperactivity, observed physical handicaps, and observed language handicap. Each teacher classified her own group, and the investigator classified each child in the three groups. The other three observers were three research assistants who had worked with each child of the experimental group during the two-year period in research projects in which the hearing and vision of the trainable child was studied. A child was classified as hyperactive, language or physically handicapped only when four of the five observers were in agreement. The above classifications for each group are presented in Table 1.

TABLE 1

EXPERIMENTAL POPULATION CLASSIFIED ACCORDING TO VARIOUS CRITERIA

Group	Mongoloid	Not Mongoloid	Neurological Involvement	Without Neurological Involvement	Hyperactive	Without Hyperactivity	Physically Handicapped	Without Physical Handicap	Language Handicapped	Without Language Handicap
A	4	5	6	3	3	6	4	5	5	4
B	2	4	5	1	2	4	2	4	4	2
C	3	5	7	1	1	7	0	8	2	6

[a] Public School Group

[b] Opportunity Center Group

[c] State School Group

4. Differences Between Intelligence Quotients and Social Quotients

Psychological evaluations were obtained on each child at the beginning and at the end of the study. The differences between the first and the last intelligence quotients and social quotients are presented in Table 2.

It is noted that there were three changes of ten points or more in intelligence quotients among the 30 subjects. The intelligence quotient of subject number one increased 10 points, subject number 17 gained 17 points, and that of subject number 35 decreased 13 points. Subject numbers one and 17 were of the experimental groups, and it is possible that these subjects gained in their ability to respond and express themselves, which enabled the psychologist to gain a better evaluation of their ability. It was determined during the period of the research that the subject number 17 had a severe hearing loss, which influenced the performance of this subject in the testing situations. Subject number 35 was in the control group and, therefore, did not participate in an organized training program. The exact cause, however, for these changes was not known.

There were five individuals who had changes of 10 or more points in the social quotients. Four of these changes were gains and

TABLE 2

DIFFERENCES BETWEEN INTELLIGENCE QUOTIENTS AND SOCIAL QUOTIENTS OBTAINED FALL 1957 AND SPRING 1959 FOR THE EXPERIMENTAL AND CONTROL GROUPS

Subject	Difference	
	I.Q.	S.Q.
1	10	18
2	- 5	3
3	- 3	- 1
4	- 3	3
5	0	23
6	- 2	4
7	0	10
8	- 1	2
9	1	- 1
10	- 2	- 2
11	1	0
13	8	8
15	- 6	20
17	17	0
18	6	3
19	- 6	1
20	4	3
21	3	-10
22	- 4	2
23	8	0
24	1	0
26	- 3	6
27	- 4	- 3
28	- 8	6
30	?[a]	3
31	?	- 5
32	?	- 5
33	- 1	- 3
34	0	2
35	-13	- 7

[a] Intelligence testing was attempted, but intelligence quotients could not be established.

one was a loss. The four changes indicating improvement were among those children who lived at home and attended a training class away from home. The parents gave the information for these ratings. Thus, only four of the 15 parents whose trainable child lived at home and participated in training rated their child somewhat differently at the end of the project than at the beginning. The quotient showing regression was for a child at the State School and the information was given by attendants. The information for each Vineland Scale for this child was given by a different attendant, which may have accounted for the difference in the two social quotients. The exact cause, however, for these changes was not known. There were no changes of 10 or more points in the social quotients for the population of the control group.

B. Curriculum

The curriculum, as previously pointed out, was composed of seven areas: social adjustment, self care, language development, physical development, music, arts and crafts, and economic usefulness. Sample pages from the curriculum and lesson plans are presented in the Appendix. The complete curriculum was too extensive to be included in this report, but may be published in the near future.

Adjustments in the lesson plans were permitted, but, as stated in Chapter III, the substitution used was in the same area of training as the activity for which the substitution was made. Group C, at the State School, followed some of the activities of that school, such as attending or performing at the school assemblies. Also, this group did not eat lunch at the school building as did Groups A and B, but returned to their dormitory at 11:30 A.M. for lunch. They returned to school at 12:30 P.M. for one hour; therefore, they attended school the same number of hours as did Groups A and B. During this last hour, those activities required of them as part of the regular State School program were permitted, such as preparation for assembly programs, as well as any activity of the lesson plans omitted because of the regular State School program. An attempt was made to control the deviations from the lesson plans and to supervise this last hour of class at the State School to conform to the programs of Groups A and B. It was believed that these deviations made by the three groups were not of such degree or nature to invalidate the control provided through the lesson plans. A record of the deviations is presented in Table 3.

C. Observations of Teaching Situations

As previously pointed out, an evaluation of each teaching situation was obtained. Each one was observed and described by three individuals according to Sander's Descriptive Schedule (9).

Observer I had experience as a teacher in a school for mentally retarded children, public school administrative experience in the

TABLE 3

NUMBER OF DEVIATIONS FROM THE LESSON PLANS FOR THE TRAINING PROGRAM FOR THE THREE EXPERIMENTAL GROUPS FROM JANUARY 1958 THROUGH MAY 1959

Month and Year		Teacher of Group A[a]	Teacher of Group B[b]	Teacher of Group C[c]
January	1958	2	7	10
February	1958	2	4	12
March	1958	4	9	11
April	1958	3	9	7
May	1958	1	5	7
September	1958	6	13	10
October	1958	3	10	12
November	1958	1	5	9
December	1958	2	7	8
January	1959	2	10	7
February	1959	5	3	7
March	1959	2	6	6
April	1959	0	4	13
May	1959	1	4	7

[a] Public School Group

[b] Opportunity Center Group

[c] State School Group

field of special education, and teaching experience in the field of special education. Observer II had experience as a teacher and a principal in a state school for the deaf and mentally retarded. At the time of the observation, he was a doctoral student at The University of Texas and was doing research in the area of trainable mentally retarded children. Observer III had teaching experience in public schools at the kindergarten and primary levels, and had teaching experience at the college level in the field of kindergarten and primary education. At the time of the observation, this individual was a graduate student at the doctoral level in the field of education and was working as a supervisor of student teaching at The University of Texas.

The four schedules on which each teaching situation was described were Schedule B--Provision for Individual Differences; Schedule D--Social Organization and Classroom Psychological Climate; Schedule E--Efficiency and Orderliness of Classroom Activities; and Schedule F--Order Maintaining Techniques. The Descriptive Schedules were designed on the assumption that level one described the least desirable procedure, with level five describing the most desirable.

The observations were not made simultaneously and somewhat different procedures were used by the different observers; therefore, the data were not treated statistically. The observations are presented in Table 4. The observations are summarized as follows:

TABLE 4

OBSERVATIONS OF THE THREE EXPERIMENTAL TEACHING SITUATIONS BY THREE OBSERVERS ACCORDING TO SANDERS' DESCRIPTIVE SCHEDULE

Teacher of Group A
(Public School Group)

Descriptive Schedule	Level				
	I	II	III	IV	V
Observer I					
B	0	0	6	3	12
D	0	0	2	0	3
E	0	0	3	1	1
F	0	0	0	2	0
Observer II					
B	0	0	7	4	0
D	0	0	4	2	0
E	0	0	2	3	0
F	0	0	0	2	0
Observer III					
B	0	0	2	7	5
D	0	1	2	9	8
E	0	0	1	4	0
F	0	0	2	2	5

TABLE 4--Continued

Teacher of Group B
(Opportunity Center Group)

Descriptive Schedule	Level				
	I	II	III	IV	V
			Observer I		
B	0	1	2	3	12
D	0	1	2	1	1
E	0	1	2	2	0
F	0	0	1	1	0
			Observer II		
B	0	0	6	4	0
D	0	0	3	1	0
E	0	1	0	0	0
F	0	0	0	3	3
			Observer III		
B	0	0	0	6	8
D	0	0	2	8	7
E	0	0	2	3	1
F	0	0	2	1	5

TABLE 4--Continued

Teacher of Group C
(State School Group)

Descriptive Schedule	Level				
	I	II	III	IV	V
Observer I					
B	0	2	8	8	3
D	0	0	2	0	3
E	0	0	1	0	5
F	0	7	2	0	0
Observer II					
B	0	0	6	8	0
D	0	0	5	2	1
E	0	0	3	2	0
F	0	5	3	0	0
Observer III					
B	14	0	1	1	0
D	6	9	0	0	0
E	0	3	2	0	0
F	6	2	0	0	0

1. The observers agreed that the teacher of Group A was operating, at the times of the observation periods, within the three highest levels of each Descriptive Schedule, with the exception of one observation at level two.

2. The observers also agreed that the teacher of Group B was operating, at the times of the observation periods, within the three highest levels, with the exception of four observations which were made at level two.

3. There was less agreement in the observations made of the class operations of the teacher of Group C. Observers I and II made the majority of their observations at the three highest levels of Schedules B, D, and E. On Schedule F, however, the majority of the observations were at level two. Observer III made the majority of the observations at level one and two.

The observers agreed that the teaching procedures of the teachers of groups A and B were at essentially the same level of efficiency. The teaching procedures of the teacher of Group C was observed to be at a slightly lower level than those of the other two teachers.

D. Opinionaires

Opinionaires were obtained from the staff of the Wooldridge Public School relating to the acceptance of the class for trainable children by the school staff and by the so-called "normal" child attending that school. These opinionaires were completed anonymously. It is recognized that no assumptions other than those for this one school may be made because of the small number of opinionaires completed. A tabulation of the responses on the opinionaires is presented in Table 5.

It is noted that one of the eleven individuals completing the opinionaire at the end of the first year of the research was not aware that the class for trainable children was in the building. At this same time, there were two individuals who thought the class should not be in the building. On the opinionaires at the beginning of the second year, no one stated that the class should not be in the building; however, at the end of the second year, this number was increased to three.

No one stated that they thought the class for trainable children would disrupt the regular school program, although two were undecided at the end of the first year. Approximately 50 per cent of the teachers prepared their class for accepting the trainable child. There was no one who thought the influence of the class was unfavorable for the so-called "normal" child, and the teachers reported that the members of their respective classes tended to accept the trainable child.

E. Statistical Treatment of the Progress Ratings

1. Scale

As mentioned in the previous chapter, there were 53 scales designed to measure the performance of the subjects in the research

TABLE 5

OPINIONAIRE COMPLETED BY THE STAFF OF THE PUBLIC SCHOOL RELATING TO THE ACCEPTANCE OF THE CLASS FOR TRAINABLE CHILDREN BY THE SCHOOL STAFF AND SO-CALLED "NORMAL" CHILDREN ATTENDING THAT SCHOOL

Question		Yes	No	No Comment	Undecided	Favorably	Little Influence	No Reaction
1. Did you know such a class is in your building?	a	11	1					
	b	10						
	c	11						
2. Do you think such a class should be in the public schools?	a	8	3	1				
	b	9		1				
	c	6	3	2				
3. Do you think this class has or will disrupt the over-all school program?	a		9		3			
	b		10					
	c		11					
4. Have you prepared your class for these children?	a	5	4	3				
	b	4	6					
	c	7	4					
5. What influence do you think it will have on your children?	a			1		7	4	
	b					5	5	
	c					7	4	
6. If your students have come in contact with the trainable children, how have they reacted to them?	a					d		
						8		2
						9		2

[a] June, 1958

[b] September, 1958

[c] June, 1959

[d] Question 6 was not included in the Opinionaire of June, 1958

population in the seven areas of the curriculum. Sample pages from the rating scale are presented in the Appendix. In order to condense the ratings for statistical treatment, average ratings of the different tasks in each of the seven areas of the curriculum were computed for each individual for each rating period. For example, one average score was computed for each individual of the ratings for the ten tasks or activities in the area of social adjustment. The eight skills in the area of physical development, however, were divided into activities of physical development, gross muscles (without equipment); physical development, gross muscles (with equipment); and physical development, small muscles, and separate average scores were computed for each individual for each of the physical development areas. Thus, there was an average score for each rating period for each individual on nine scales which measured the progress in the seven areas. These scales were: Social Adjustment; Self Care; Language Development; Arts and Crafts; Music; Economic Usefulness; Physical Development, Gross Muscles (without equipment); Physical Development, Gross Muscles (with equipment); and Physical Development, Small Muscles. The ratings of the task of brushing teeth, in the area of Self Care, were not included in the statistical treatment as it was known that there were significant differences between the groups in the manner and time this skill was taught.

As previously stated, the investigator and the child's teacher rated each child. In order to determine the degree of agreement of the independent judgment of the two raters, before the teacher and research assistant rated the children on the joint-decision basis in January, 1959, each teacher rated her own group independently and the investigator rated each group independently. The rank order correlation, as described by Edwards (4), was computed using the two independent ratings on each scale for each group. These correlations are presented in Table 6.

It is noted that the correlations of the two independent ratings were above .80 for each scale for each group except on four scales. These scales were Physical Development, Gross Muscles (without equipment) for both Groups A and B and Self Care and Economic Usefulness for Group C. The correlations for these scales were above .70. If the individual ratings correlated this high, it is probable that the ratings made by joint-decision would have a higher degree of correlation.

2. Statistical Treatment

Grant's (21) trend analysis (F ratio) was used to compare the progress of the three experimental groups. In addition to the comparison of the average progress of the groups, the six ratings for each of the groups provided five components of the learning curves which could be analyzed. Thus, independent statistical tests were available for the existence of significant linear, quadratic, cubic, quartic, and quintic

TABLE 6

RANK ORDER CORRELATION FOR EACH GROUP OF THE INDEPENDENT RATING OF EACH TEACHER FOR HER GROUP WITH THAT OF THE INVESTIGATOR

Scale	Correlation		
	Group A[a]	Group B[b]	Group C[c]
Social Adjustment	.94	.97	.87
Self Care	.83	.94	.77
Language Development	.85	.84	.87
Physical Development, Gross Muscles (Without Equipment)	.78	.74	.91
Physical Development, Gross Muscles (With Equipment)	.88	.81	.86
Physical Development, Small Muscles	.84	.96	.88
Arts and Crafts	.86	.93	.84
Economic Usefulness	.90	.88	.78
Music	.95	.94	.87

[a] Public School Group

[b] Opportunity Center Group

[c] State School Group

components of the learning curves. In order to compare the progress of the control group with that of the three experimental groups, Grant's trend analysis was computed using the three ratings of the control group and the three ratings of the experimental groups which were made at the same time as those of the control group: February, 1958; September, 1958; and May, 1959. These three ratings provided only two components of the learning curves which could be analyzed; therefore, independent statistical tests were available for the significance only of linear and quadratic components of these learning curves.

Since the average mental age and chronological age for one of the groups was approximately one year higher than that of the other groups, as can be seen in the data, it seemed possible that this difference might account for differences in progress. Scatter plots were made, therefore, of mental ages against each of the components of the trend analysis which measured between group differences, and also of mental ages against each of the components which measured the linear trends. In addition, scatter plots were made using the same two components of the trend analysis and chronological ages. Separate scatter plots were made for each of the nine scales for the six ratings of the experimental groups, and for each of the nine scales for the three corresponding ratings of the experimental and control groups. An analysis of covariance, as described by McNemar (7), was computed on all scales for which the scatter plots indicated the possibility of a significant relationship. These scales were Social Adjustment; Language Development; Music; Economic Usefulness; and Physical Development, Gross Muscles (without equipment). On the first four scales named, the analysis of covariance controlled for differences between the groups in mental age. On the last scale, Physical Development, Gross Muscles (without equipment), the covariance controlled for differences between the groups in chronological age.

There were three scales of the experimental groups for which the variance revealed by the analysis of covariance did not agree with that revealed by the trend analysis. The variance revealed by the analysis of covariance, therefore, was substituted for that of the trend analysis. These three scales were Social Adjustment, Language Development, and Music. These results are shown later in this chapter and also in Tables 30, 32, and 38, Appendix E. The variance revealed by the analysis of covariance agreed with those of the trend analysis for these same scales, and all other scales, in the statistical treatment of the data of the control and experimental groups. The variances revealed by the analysis of covariance were substituted for the trend scales of Social Adjustment, Language Development, and Music, so that the same procedure of statistical treatment was followed in the analysis of the data for the control and experimental groups as was followed for the three experimental groups. The statistical procedure used on those scales where the analysis of covariance was substituted was as follows: the trend analysis was utilized to treat the progress of the groups as a whole, and to compare the progress between individuals; the analysis of covariance was utilized to compare the average over-all performance of the groups, and to compare the progress between the various groups.

The Mann-Whitney U Test, described by Siegel (10), was used to compare the progress of the children of the experimental groups classified according to certain categories. These classifications were described earlier in this chapter and are as follows: mongolism, neurological involvement, observed hyperactivity, observed physical handicap, and observed language handicap. The difference score, which was the difference between the first rating and the last or sixth rating, for each child on each rating scale was used for statistical treatment. These findings are presented later in this chapter.

F. Findings of the Progress Ratings

1. Experimental Groups

a. Social Adjustment

(a-1). Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, shown in Table 7 (item A-1), indicates the average performance of the three experimental groups as a whole changed significantly in the area of social adjustment as measured by the six ratings on the scale of Social Adjustment. Examination of Figure 1 shows that this change was in the direction of improved performance.

The significance of the quadratic component of the over-all trend, between trials, as shown in Table 7 (item A-2), indicates the trend for the first year was significantly different from that of the second year. Figure 1 shows that more progress was made by the experimental group as a whole during the first year than during the second year.

Although the over-all trend of performance of the three experimental groups was one of progress, according to the significance of the cubic component, shown in Table 7 (item A-3), there was significant regression or plateaus in the over-all trend during the two-year period of training.

The quartic component of the over-all trend, between trials, as may be seen in Table 7 (item A-4), indicates that the trend for the

TABLE 7

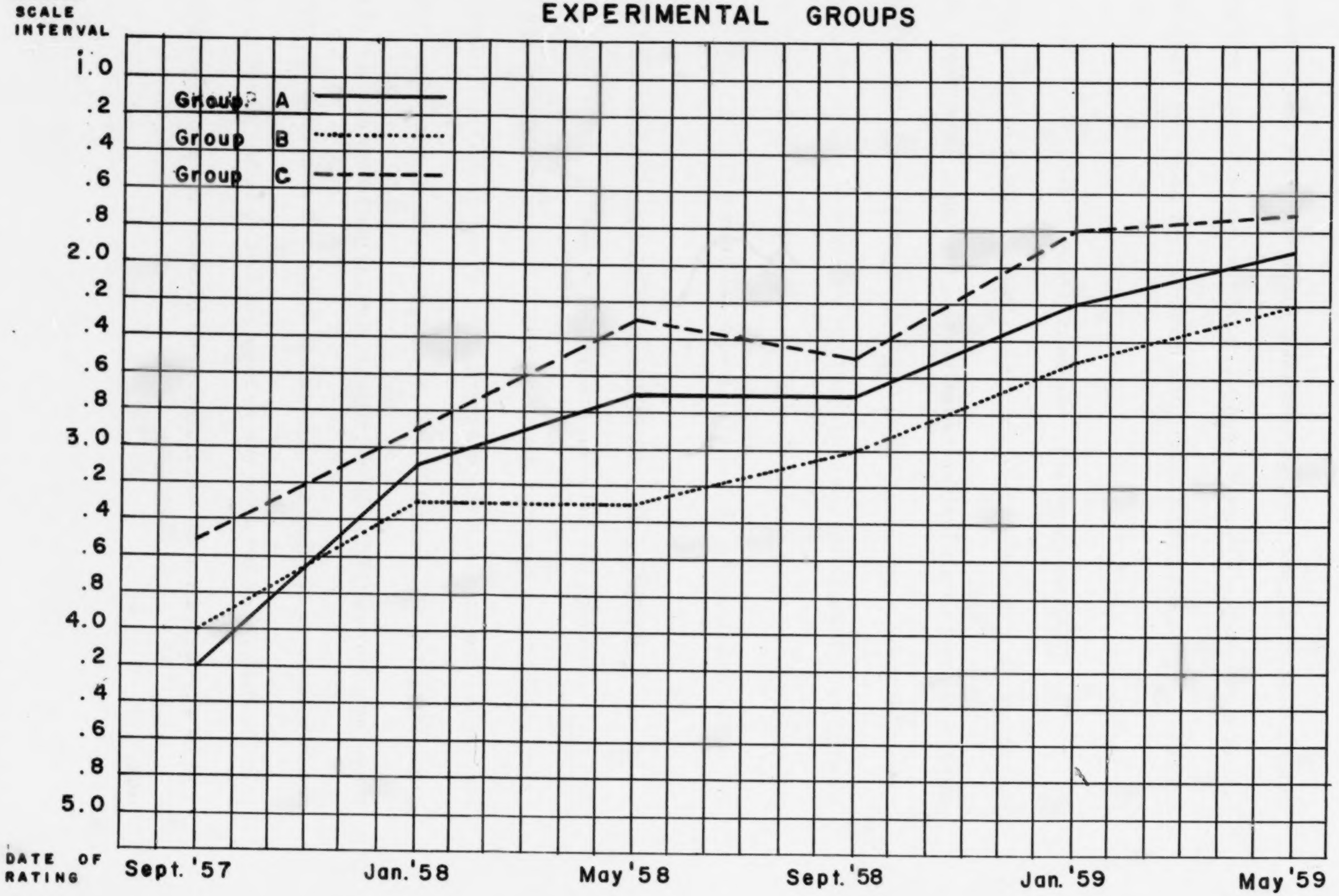
SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF SOCIAL ADJUSTMENT FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	229.60	.001
1. Linear	663.75	.001
2. Quadratic	16.43	.001
3. Cubic	38.00	.001
4. Quartic	25.00	.001
5. Quintic	21.33	.001
B. Between Group Means	.77*	n. s.
C. Between Group Trends	--	--
1. Linear	1.41*	n. s.
2. Quadratic	3.26*	n. s.
3. Cubic	2.31*	n. s.
4. Quartic	.49*	n. s.
5. Quintic	5.66*	.05
D. Between Individual Means	16.20	.001

* Analysis of Covariance

FIGURE I

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF SOCIAL ADJUSTMENT FOR THE EXPERIMENTAL GROUPS



first half of each year was significantly different from that of the last half of each year. Figure 1 suggests that the experimental groups as a whole progressed more during the first half of each year than during the last half of each year.

The quintic component, shown in Table 7 (item A-5), indicates the presence of an up-and-down or saw-toothed effect in the over-all pattern of the ratings for the experimental groups. This effect indicates that there were alternating degrees of progress from rating to rating, even though the over-all pattern was one of improvement. This effect may have been due to changes in the judgment of the raters; however, the exact cause of this effect was not known.

(a-2). Comparison Between Average Over-all Performance of the Groups. Although the between group means of the trend analysis indicated a difference between the groups in the level of the average performance, the analysis of covariance, as shown in Table 7 (item B), controlling for differences between the groups in mental age, indicates there were no statistically significant differences between the adjusted mean ratings on the Social Adjustment Scale. It appears, therefore, that the difference between the groups according to the trend analysis can be accounted for by the differences between the groups in mental age.

(a-3). Comparisons Between Progress of the Experimental Groups. The quadratic component of the trend analysis suggested that the trends of each group differed significantly in relation to the changes in performance during the first year compared with those during the second year. Although the trend analysis suggested that the groups differed in relation to the quadratic component, the analysis of covariance, as may be seen in Table 7 (item C-1), controlling for differences between the groups in mental age, indicates no significant difference in the quadratic component of the groups. Thus, it appears that the original difference between the quadratic component of the groups can be accounted for by the difference between the groups in mental age.

Although each group made progress during the two-year period, the quintic component of the analysis of covariance, as may be seen in Table 7 (item C-5), tends to indicate that the groups differed significantly in relation to the amount of the saw-toothed or up-and-down effect present in their respective trends. As stated before, this effect indicates that there were alternating degrees of progress from rating to rating in the respective trends for each group. As previously pointed out, this effect may have been due to changes in the judgment of the raters; however, the exact cause was not known.

(a-4). Comparison Between Progress of Individuals. The between individual means, shown in Table 7 (item D), indicate that there were significant differences between subjects in their over-all average performance over the two-year period.

b. Self Care

(b-1). Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, as may be seen in Table 8 (item A-1), indicates that the over-all pattern of the average ratings for the experimental groups as a whole changed significantly on the scale of Self Care during the two-year period. Figure 2 shows that this change was in the direction of improvement.

The significance of the quadratic component of the over-all trend, between trials, shown in Table 8 (item A-2), tends to indicate that the change in performance for the first year was different from that of the second year. Inspection of Figure 2 reveals that the experimental group as a whole tended to make more progress during the first year than during the second year.

It appears that significant regression occurred in the over-all trend during the two-year period of training even though the over-all pattern of the experimental groups was one of improvement. This trend is indicated by the significance of the cubic component of the over-all trend, between trials, as shown in Table 8 (item A-3).

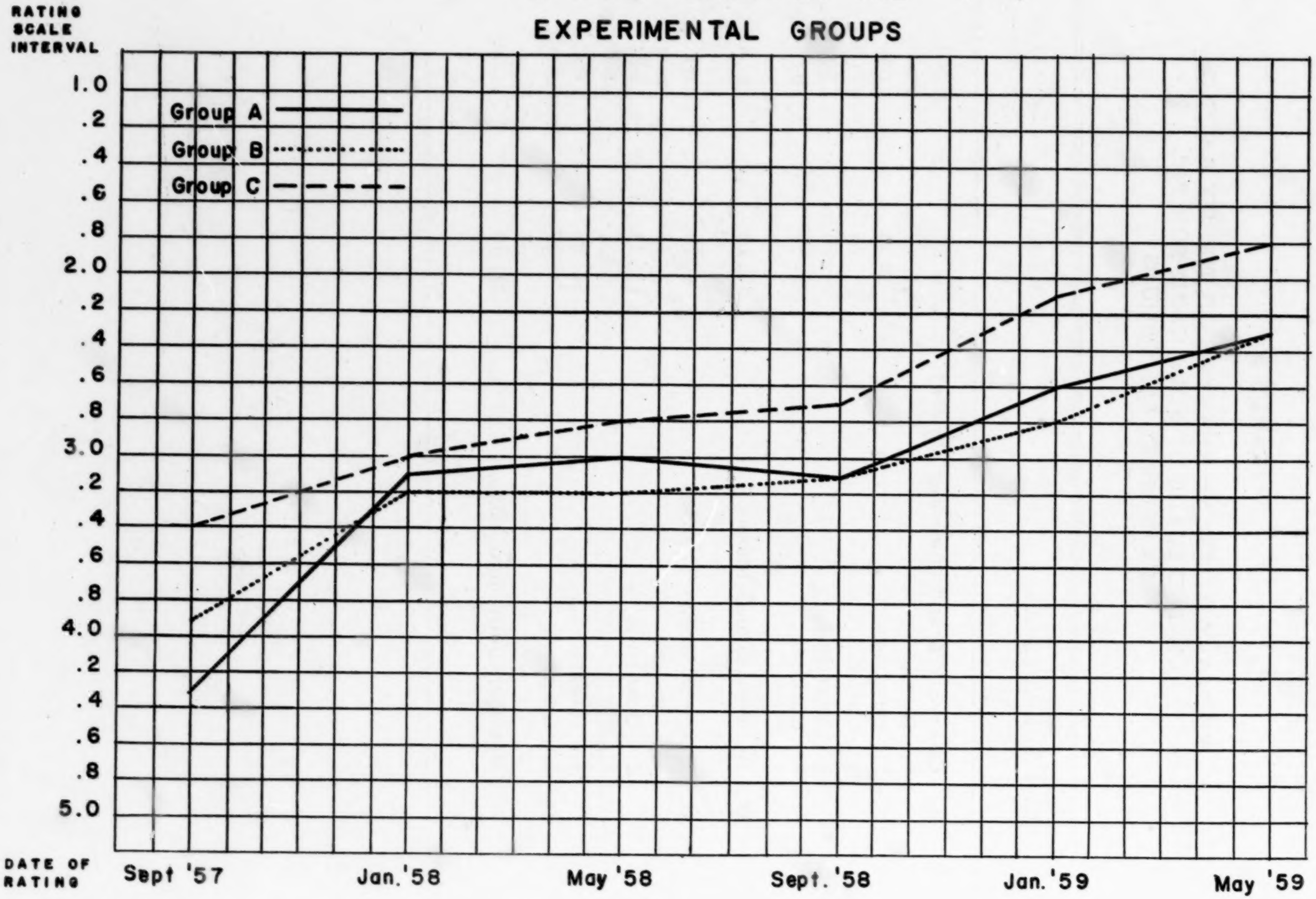
TABLE 8

SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF SELF CARE FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	200.25	.001
1. Linear	401.89	.001
2. Quadratic	5.00	.05
3. Cubic	65.75	.001
4. Quartic	49.50	.001
5. Quintic	2.67	n.s.
B. Between Group Means	3.13	n.s.
C. Between Group Trends	4.75	.01
1. Linear	1.33	n.s.
2. Quadratic	12.33	.001
3. Cubic	8.25	.01
4. Quartic	4.50	.05
5. Quintic	1.67	n.s.
D. Between Individual Means	24.50	.001

FIGURE 2

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF SELF CARE FOR THE EXPERIMENTAL GROUPS



The quartic component, shown in Table 8 (item A-4), indicates that the over-all trend for the first half of each year was different from that of the last half of each year. Figure 2 tends to suggest that as a whole the experimental groups made more progress during the first half of each year than during the last half of each year.

(b-2). Comparison Between Average Over-all Performance of the Groups. The between group means, shown in Table 8 (item B), indicate that there was no significant difference between the average level of performance of the experimental groups during the two-year period.

(b-3). Comparisons Between Progress of the Experimental Groups. The quadratic component of the between group trends, shown in Table 8 (item C-2), indicates that the groups differed significantly in relation to the changes in performance during the first year compared to those made during the second year. Examination of Figure 2 reveals that Group A made more progress the first year than the second year, while Groups B and C made slightly more progress the second year.

Although each group made significant progress, the cubic component of the between group trends, as may be seen in Table 8 (item C-3), suggests that the groups differed in relation to the regression in their respective trends. Figure 2 shows that Group A experienced a leveling-off in its progress from the rating of January, 1958, to May, 1958, and then slight regression from May, 1958, to September, 1958. The trends of Groups B and C tend to indicate a leveling-off of progress from January, 1958, to September, 1958.

The quartic component, shown in Table 8 (item C-4), indicates that the three experimental groups differed significantly with respect to the differences in their trends for the first half of each year compared with those of the last half.

(b-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 8 (item D), indicate that there were significant differences between subjects in their over-all average level of performance over the two-year period.

c. Language Development

(c-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, between trials, shown in Table 9 (item A-1), for the three experimental groups indicates that the average ratings changed significantly during the two-year period on the Language Development Scale. Figure 3 shows that these changes were in the direction of improvement.

The quadratic component, as may be seen in Table 9 (item A-2), indicates that the over-all trend of the average ratings for the first year differed from that of the second year. Figure 3 shows that the average

TABLE 9

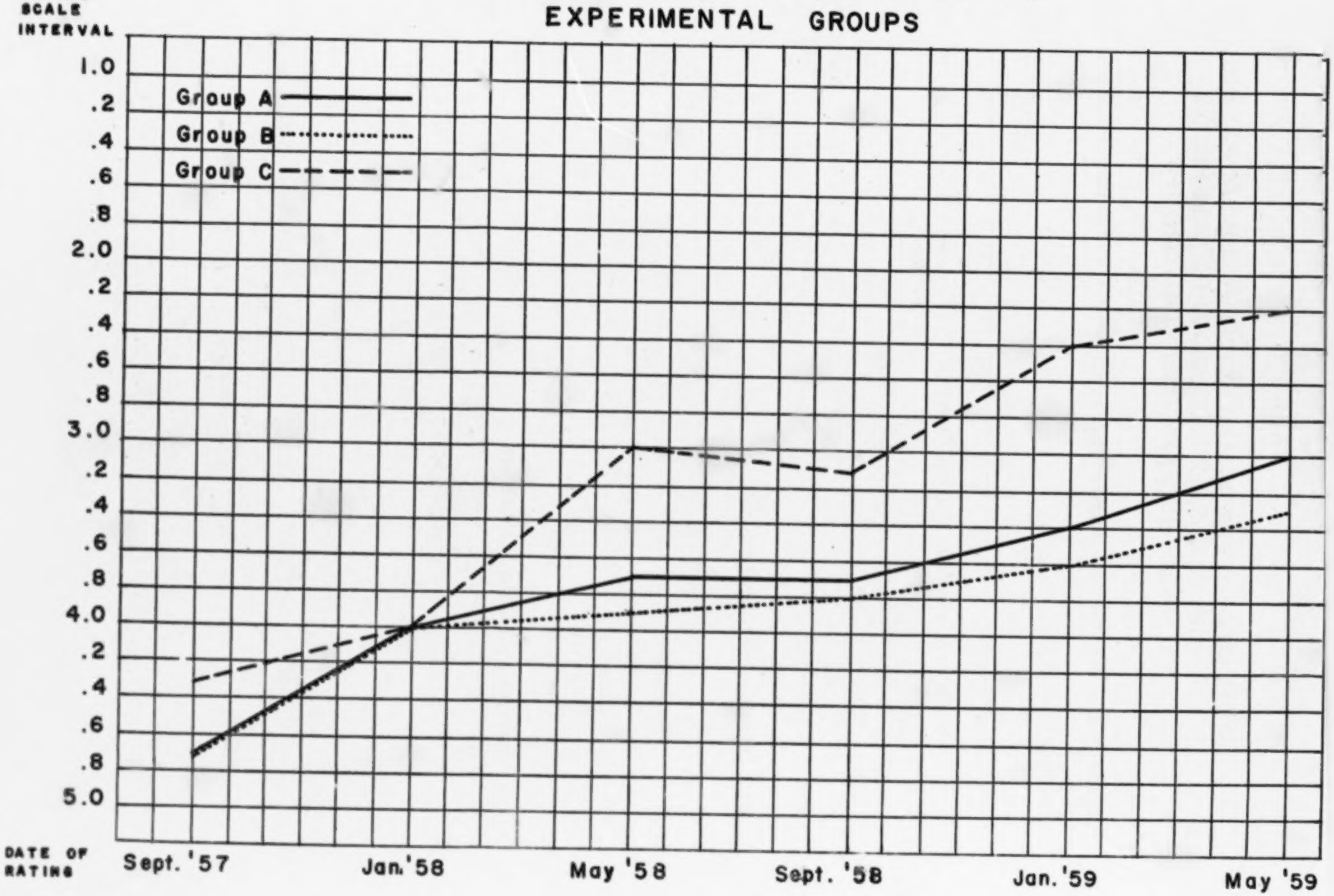
SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF LANGUAGE DEVELOPMENT FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	221.25	.001
1. Linear	419.60	.001
2. Quadratic	36.50	.001
3. Cubic	29.33	.001
4. Quartic	2.00	n. s.
5. Quintic	32.00	.001
B. Between Group Means	.01*	n. s.
C. Between Group Trends	--	--
1. Linear	1.93*	n. s.
2. Quadratic	.58*	n. s.
3. Cubic	14.92*	.001
4. Quartic	1.40*	n. s.
5. Quintic	11.72*	.001
D. Between Individual Means	26.50	.001

* Analysis of Covariance

FIGURE 3

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF LANGUAGE DEVELOPMENT FOR THE EXPERIMENTAL GROUPS



ratings showed more progress during the first year than during the second year.

Regression occurred in the over-all trend, between trials, as indicated by the cubic component, shown in Table 9 (item A-3), even though the over-all trend for the period of training was one of improvement.

The significance of the quintic component, shown in Table 9 (item A-5), indicates the presence of a saw-toothed or an up-and-down effect in the over-all pattern of the six ratings. As previously pointed out, this effect indicates that there were alternating degrees of progress from rating to rating, even though the over-all pattern was one of improvement.

(c-2) Comparison Between Average Over-all Performance of the Groups. Although the between group means of the trend analysis indicated a difference in the level of average performance between the groups on the ratings of the Language Development Scale, an analysis of covariance, as may be seen in Table 9 (item B), indicates that when these ratings were adjusted for differences between the groups in mental age, the differences between the adjusted mean ratings on the Language Development Scale were not statistically significant; that is, there were no longer significant differences in the level of average performance between the three groups.

(c-3) Comparisons Between Progress of the Experimental Groups. The linear component of the trend analysis indicated that the linear trends of the groups differed significantly, which is interpreted to mean that the groups progressed at significantly different rates during the two years. The analysis of covariance, shown in Table 9 (item C-1), controlling for differences in mental age, however, indicates no significant difference in the linear trends of the groups. Thus, the original difference between the groups can be accounted for by the differences between the groups in mental age.

The cubic component of the analysis of covariance, shown in Table 9 (item C-3), indicates that the groups differed in relation to the plateaus or regression occurring in their respective trend. Inspection of Figure 3 suggests that Groups A and B tended to experience a leveling-off in their progress between the January, 1958, and September, 1958, ratings; while the trend of Group C indicated regression from the May, 1958, to the September, 1958, rating.

The quintic component of the analysis of covariance, shown in Table 9 (item C-5), indicates that the trend for each group differed significantly in relation to the amount of the saw-toothed or up-and-down effect present in their respective trend. This effect indicates that there were alternating degrees of progress from rating to rating in the respective trend for each group during the two-year period. This effect may have been due to changes in the judgment of the raters; however, the exact cause was not known.

(c-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 9 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the two-year period.

d. Physical Development, Gross Muscles (without equipment)

(d-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, between trials, shown in Table 10 (item A-1), indicates that the average ratings of the three experimental groups as a whole changed significantly during the two-year period of training on the scale of Physical Development, Gross Muscles (without equipment). An examination of Figure 3 shows that this change was in the direction of improvement.

The quadratic component of the over-all trend, between trials, as may be seen in Table 10 (item A-2), indicates that the over-all pattern of the average ratings as a whole for the first year differed significantly from that of the second year. Figure 4 suggests that more progress was made during the first year than during the second year.

Although the over-all pattern of the average ratings of the experimental groups for the two-year period was one of improvement,

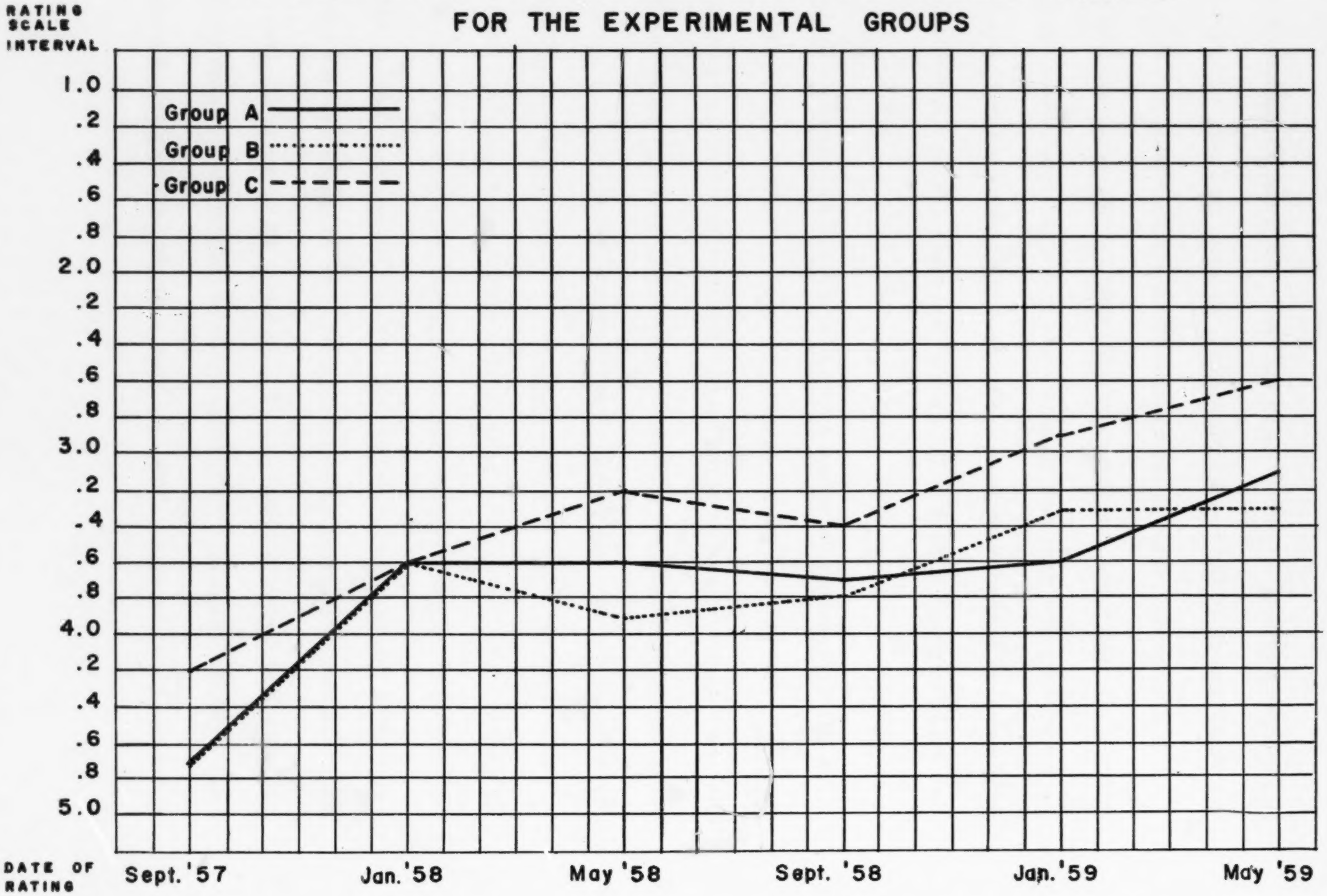
TABLE 10

SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLES (WITHOUT EQUIPMENT) FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	63.30	.001
1. Linear	206.00	.001
2. Quadratic	9.79	.01
3. Cubic	59.71	.001
4. Quartic	15.75	.001
5. Quintic	1.33	n. s.
B. Between Group Means	1.90	n. s.
C. Between Group Trends	2.30	.05
1. Linear	1.25	n. s.
2. Quadratic	.64	n. s.
3. Cubic	3.86	.05
4. Quartic	3.75	.05
5. Quintic	3.67	.05
D. Between Individual Means	13.50	.001

FIGURE 4

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLE ACTIVITIES (without equipment) FOR THE EXPERIMENTAL GROUPS



significant regression occurred in the over-all trend as indicated by the significance of the cubic component, as seen in Table 10 (item A-3).

The significance of the quartic component, shown in Table 10 (item A-4), indicates that the over-all trend for the experimental groups as a whole for the first half of each year differed significantly from that of the second half of each year. Figure 4 shows that more improvement was made during the first half of each year than during the last half of each year.

(d-2) Comparison Between Average Over-all Peformance of the Groups. The between group means, as seen in Table 10 (item B), indicates that there was no significant difference between the quality of the average performance during the period of training as measured by the average ratings of the three experimental groups.

(d-3) Comparisons Between Progress of the Experimental Groups. The cubic component of the between group trends, shown in Table 10 (item C-3), tends to suggest that the experimental groups differed in relation to the regression occurring in their respective trends, although their over-all trend was one of progress. An examination of Figure 4 suggests that Group A experienced a leveling-off of progress from January, 1958, to January, 1959; Group B experienced regression from January, 1958, to May, 1958, and then a slight leveling-off of progress from May, 1958, to September, 1958; while Group C experienced regression from May, 1958, to September, 1958.

The quartic component, shown in Table 10 (item C-4), tends to indicate that the three experimental groups differed significantly with respect to the differences in their trends for the first half of each year compared with those of the last half.

The quintic component, shown in Table 10 (item C-5), tends to indicate that the groups differed significantly in relation to the amount of the saw-toothed or up-and-down effect in their respective trends. As previously pointed out, this effect indicates that there were alternating degrees of progress from rating to rating in the respective trends of the groups.

(d-4) Comparison Between Progress of Individuals. The significance of the between individual means, shown in Table 10 (item D), indicates that there were significant differences between the subjects in their overall average level of performance over the two-year period.

e. Physical Development, Gross Muscles (with equipment)

(e-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, shown in Table 11 (item A-1), of the three experimental groups indicates the performance of the groups as a whole changed significantly during the two-year period of training as measured by the ratings on the scale of Physical Development, Gross

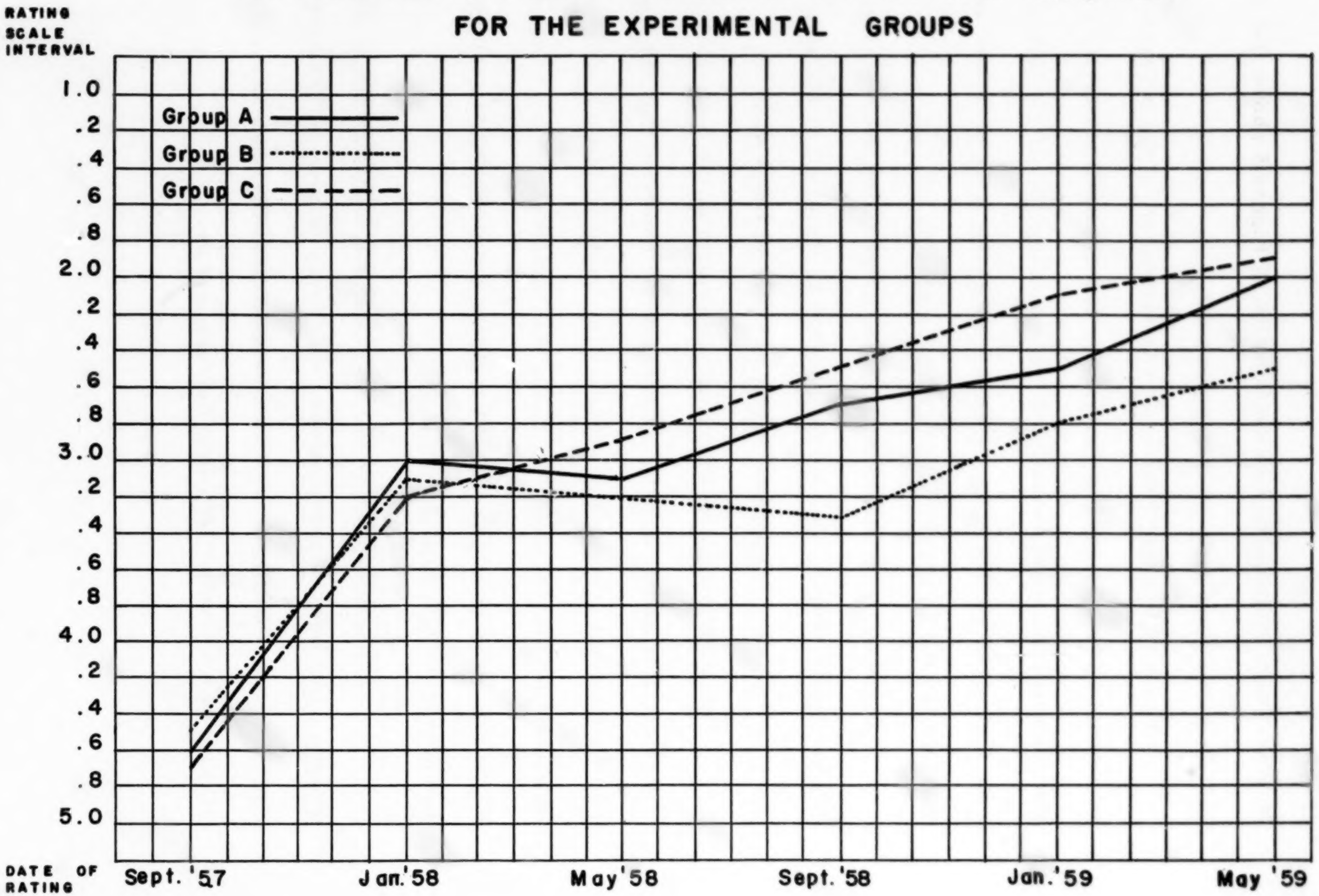
TABLE 11

SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLES (WITH EQUIPMENT) FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	174.50	.001
1. Linear	425.59	.001
2. Quadratic	144.50	.001
3. Cubic	44.85	.001
4. Quartic	37.75	.001
5. Quintic	3.00	n. s.
B. Between Group Means	.90	n. s.
C. Between Group Trends	3.40	.01
1. Linear	7.12	.01
2. Quadratic	2.50	n. s.
3. Cubic	1.62	n. s.
4. Quartic	.63	n. s.
5. Quintic	1.56	n. s.
D. Between Individual Means	13.10	.001

FIGURE 5

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLE ACTIVITIES (with equipment) FOR THE EXPERIMENTAL GROUPS



Muscles (with equipment). An examination of Figure 5 shows that the change was in the direction of improvement.

The significance of the quadratic component of the over-all trend, as shown in Table 11 (item A-2), for the experimental groups as a whole indicates that the trend for the first year was significantly different from that of the second year. Figure 5 indicates more progress was made during the first year than during the second.

Significant regression occurred at times in the over-all trend, between trials, during the two-year period as indicated by the significance of the cubic component, shown in Table 11 (item A-3).

The significance of the quartic component of the over-all trend, between trials, shown in Table 11 (item A-4), indicates that the trend for the experimental groups as a whole for the first half of each year was significantly different from that of the last half of each year. Figure 5 shows that more progress was made during the first half of each year than during the last half of each year.

(e-2) Comparison Between Average Over-all Performance of the Groups. The between group means, which may be seen in Table 11 (item B), indicates that there was no significant difference between the level of the average performance between groups.

(e-3) Comparisons Between Progress of the Experimental Groups. The linear component of the between group trends, shown in Table 11 (item C-1), indicates that the groups progressed at significantly different rates during the two-year period.

(e-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 11 (item B), indicates that there were significant differences between the subjects in their over-all average level of performance over the two-year period.

f. Physical Development, Small Muscles

(f-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, between trials, shown in Table 12 (item A-1), indicates that the average performance of the experimental groups as a whole changed significantly over the period of time spanned by the six ratings on the scale of Physical Development, Small Muscles. Inspection of Figure 6 indicates that the change was in the direction of improvement.

The significance of the quartic component of the over-all trend, between trials, as seen in Table 12 (item A-4), for the three experimental groups as a whole tends to indicate that the performance for the first half of each year was significantly different from that of the second half. Figure 6 shows that more progress was made during the first half of each year than was made during the second half of each year.

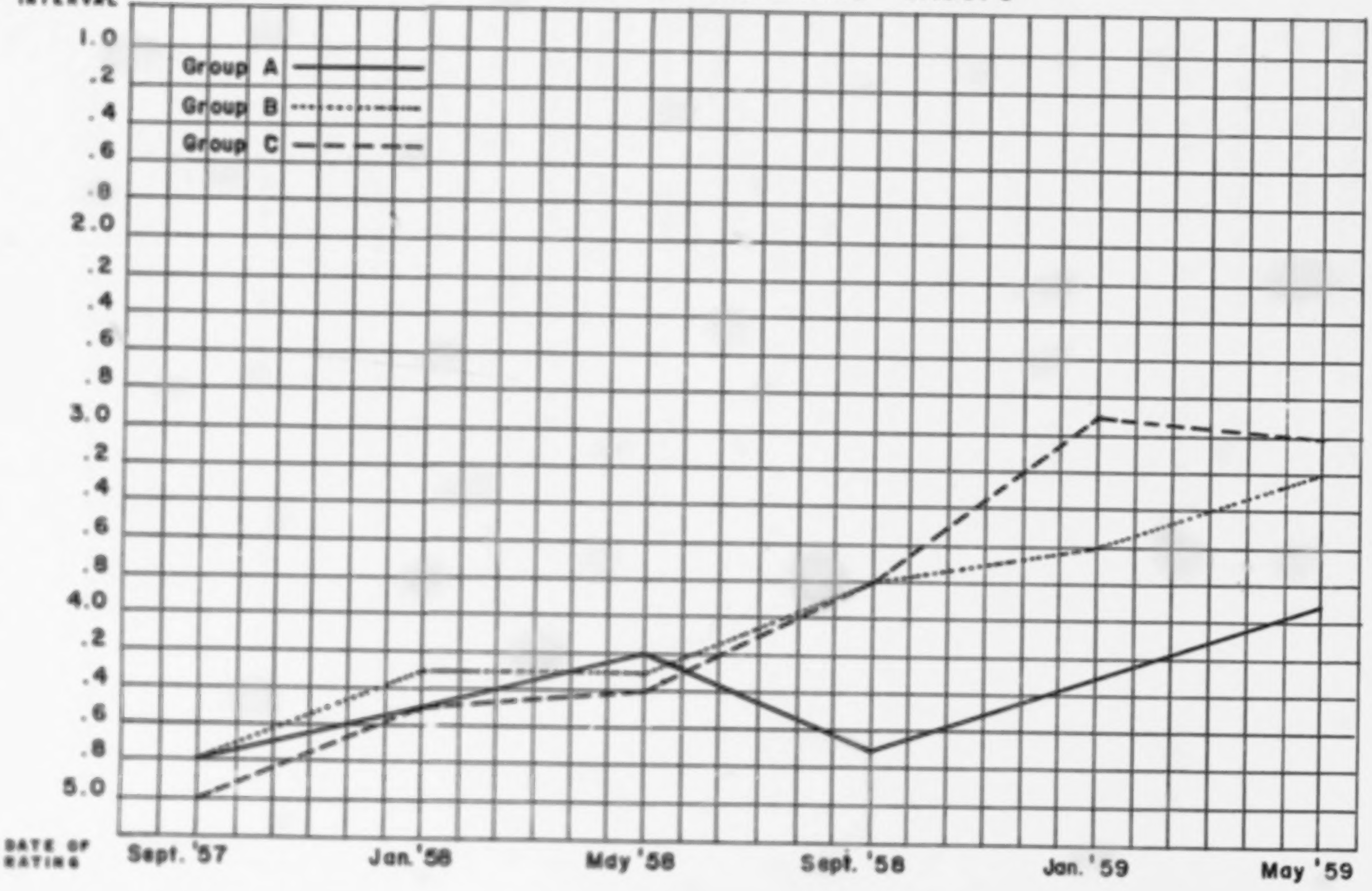
TABLE 12

SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, SMALL MUSCLES FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	61.64	.001
1. Linear	136.29	.001
2. Quadratic	.80	n. s.
3. Cubic	3.60	n. s.
4. Quartic	5.77	.05
5. Quintic	2.75	n. s.
B. Between Group Means	2.72	n. s.
C. Between Group Trends	9.00	.001
1. Linear	14.54	.001
2. Quadratic	.20	n. s.
3. Cubic	15.40	.001
4. Quartic	2.08	n. s.
5. Quintic	5.38	.05
D. Between Individual Means	11.36	.001

FIGURE 6

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, SMALL MUSCLE ACTIVITIES FOR THE EXPERIMENTAL GROUPS



(f-2) Comparison Between Average Over-all Performance of the Groups. The between group means, shown in Table 12 (item B), indicate that there was no significant difference between the level of average performance of the three experimental groups during the two-year period.

(f-3) Comparisons Between Progress of the Experimental Groups. The linear component of the between group trends, shown in Table 12 (item C-1), indicates that the groups progressed at significantly different rates during the two-year period.

Although each group made progress, the significance of the cubic component, as may be seen in Table 12 (item C-3), indicates that they differed significantly with relation to the regression in their respective trends. Inspection of Figure 6 shows that Group A regressed from the May, 1958, rating to the September, 1958 rating. The trends of Groups B and C indicate a leveling-off of progress from the January, 1958, rating to the May, 1958, rating; and, then, the trend of Group C shows a slight regression from the rating of January, 1959, to May, 1959.

The significance of the quintic component, as shown in Table 12 (item C-5), tends to indicate that the groups differed significantly in relation to the amount of the saw-toothed or up-and-down effect present in their respective trends.

(f-4) Comparison Between Progress of Individuals. The significance of the between individual means, shown in Table 12 (item B), indicates that there were significant differences between subjects in their over-all average level of performance over the two-year period.

g. Arts and Crafts

(g-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, between trials, shown in Table 13 (item A-1), indicates that the average performance of the experimental groups as a whole changed significantly during the two years. Examination of Figure 7, Arts and Crafts, shows that this change was in the direction of improved performance.

The significance of the quadratic component, as seen in Table 13 (item A-2), of the over-all trend, between trials, of the average ratings for the experimental groups as a whole indicates that the trend for the first year was significantly different from that of the second year. Figure 7 suggests more improvement was made during the first year than was made during the second.

Although the over-all trend for the experimental groups as a whole indicated improvement was made, according to the cubic component, shown in Table 13 (item A-3), there was significant regression in the over-all trend of the average ratings during the two-year period.

The significance of the quartic component of the over-all trend, between trials, as may be seen in Table 13 (item A-4), indicates that

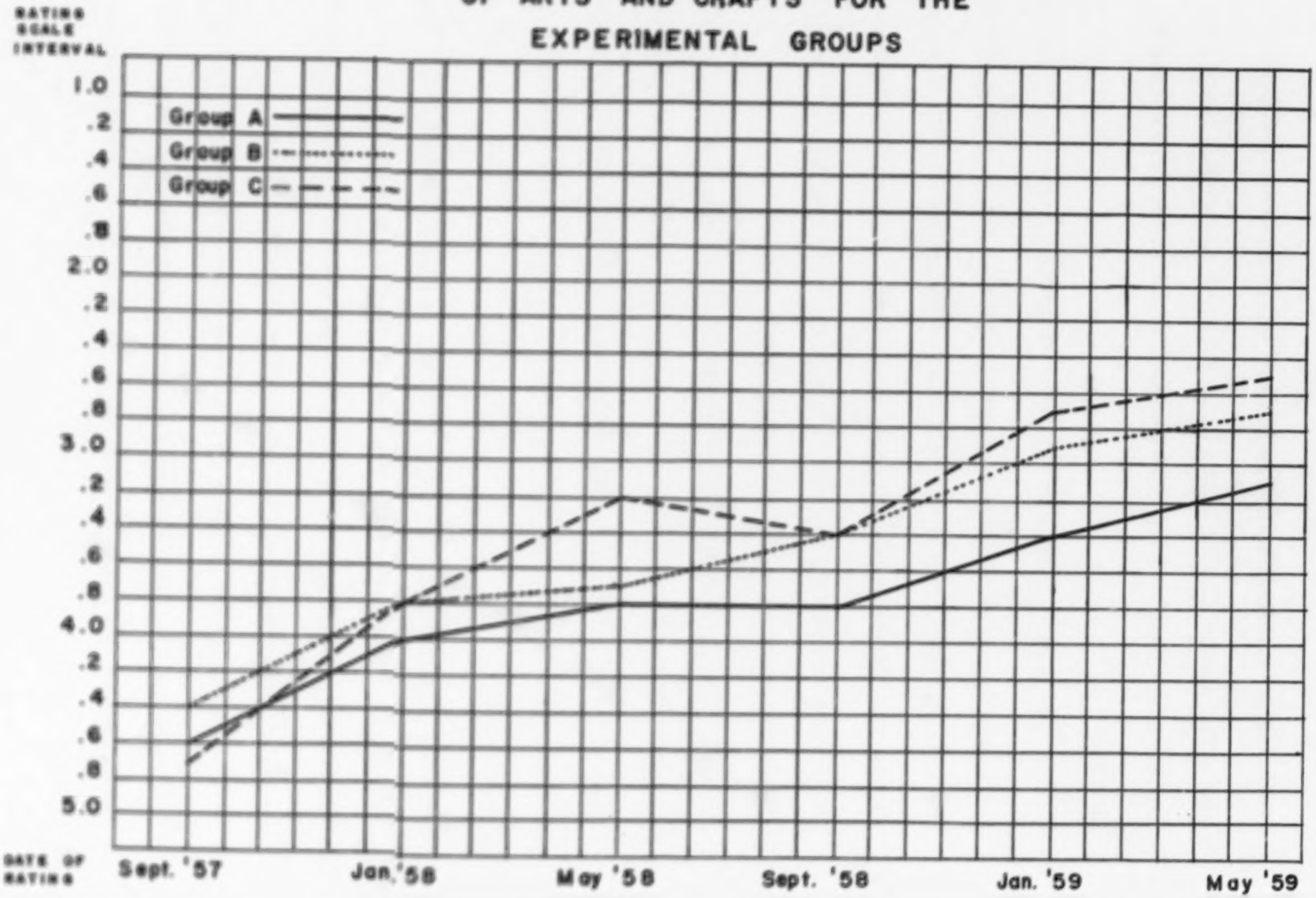
TABLE 13

SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF ARTS AND CRAFTS FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	133.00	.001
1. Linear	256.41	.001
2. Quadratic	16.00	.001
3. Cubic	16.43	.001
4. Quartic	18.00	.001
5. Quintic	20.33	.001
B. Between Group Means	2.24	n. s.
C. Between Group Trends	4.29	.01
1. Linear	4.41	.05
2. Quadratic	10.00	.001
3. Cubic	2.14	n. s.
4. Quartic	.50	n. s.
5. Quintic	9.00	.001
D. Between Individual Means	15.00	.001

FIGURE 7

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF ARTS AND CRAFTS FOR THE EXPERIMENTAL GROUPS



the trend for the first half of each year was significantly different from that of the second half of each year. Figure 7 shows that there was more improvement during the first half of each year than during the last half.

The significance of the quintic component, shown in Table 13 (item A-5), indicates a saw-toothed effect or an up-and-down effect in the over-all trend, between trials, of the six ratings for the experimental groups as a whole. As previously pointed out, this effect indicates that there were alternating degrees of progress from rating to rating even though the over-all trend was one of improvement.

(g-2) Comparison Between Average Over-all Performance of the Groups. The between group means, shown in Table 13 (item B), indicates that there was no significant difference between the level of average performance of the three experimental groups during the two-year period of training.

(g-3) Comparisons Between Progress of the Experimental Groups. The linear component of the between group trends, shown in Table 13 (item C-1), tends to indicate that the experimental groups progressed at significantly different rates during the two-year period.

The quadratic component, as may be seen in Table 13 (item C-2), indicates that the trends of the groups differed significantly in relation to the amount of change in performance during the first year compared to that during the second year. Figure 7 shows that Groups A and C made more progress during the first year than during the second, while Group B made slightly more progress during the second year than they did during the first.

The quintic component, shown in Table 13 (item C-5), indicates that the groups differed significantly in relation to the amount of the saw-toothed or up-and-down effect in their respective trends. As previously stated, this effect indicates there were alternating degrees of progress from rating to rating even though the over-all trend was one of improvement. This effect may have been due to changes in the judgment of the raters; however, the exact cause of this effect was not known.

(g-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 13 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the two-year period.

h. Economic Usefulness

(h-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, shown in Table 14 (item A-1), indicates that the six ratings on the scale of Economic Usefulness for the experimental groups as a whole changed significantly. Figure 8 shows that the change was in the direction of improvement.

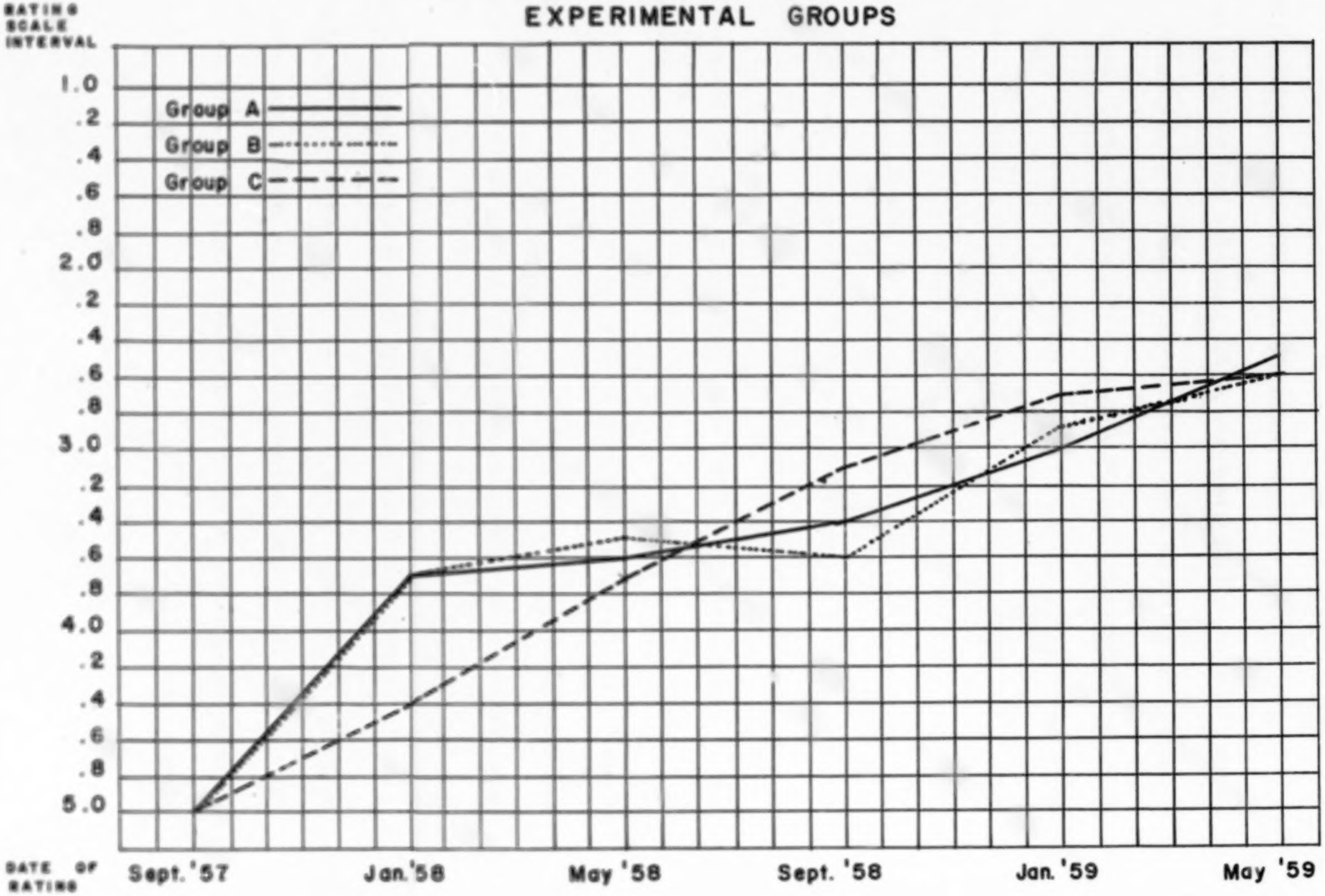
TABLE 14

SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF ECONOMIC USEFULNESS FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	287.67	.001
1. Linear	624.00	.001
2. Quadratic	64.25	.001
3. Cubic	26.00	.001
4. Quartic	19.75	.001
5. Quintic	.50	n. s.
B. Between Group Means	.07	n. s.
C. Between Group Trends	6.67	.001
1. Linear	3.38	n. s.
2. Quadratic	.25	n. s.
3. Cubic	17.71	.001
4. Quartic	6.50	.01
5. Quintic	3.00	n. s.
D. Between Individual Means	11.33	.01

FIGURE 8

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF ECONOMIC USEFULNESS FOR THE EXPERIMENTAL GROUPS



The quadratic component of the over-all trend, between trials, as may be seen in Table 14 (item A-2), indicates that the trend for the experimental group as a whole for the first year was different from that of the second year. Figure 8 shows that the experimental groups made more progress during the first year than during the second year.

The cubic component of the over-all trend, shown in Table 14 (item A-3), for the experimental groups as a whole indicates that there was significant regression at times during the two-year period in the over-all trend of the ratings on the scale of Economic Usefulness even though the over-all trend was one of progress.

The quartic component of the over-all trend, as shown in Table 14 (item A-4), indicates that the trend for the experimental groups as a whole for the first half of each year was significantly different from that of the last half of each year. Inspection of Figure 8 shows that the experimental groups made more progress during the first half of each year than during the last half of each year.

(h-2) Comparison Between Average Over-all Performance of the Groups. The between group means, as may be seen in Table 14 (item B), indicate that there was no significant difference between the level of the average performance of the experimental groups in the area of economic usefulness.

(h-3) Comparisons Between Progress of the Experimental Groups. Although each group made progress during the two-year period, the cubic component of the between group trends, shown in Table 14 (item C-3), indicates that the groups differed in relation to the regression in their respective trends. Figure 8 suggests that the trend of Group A showed a leveling-off of progress from the rating of January, 1958, to September, 1958. The trend of Group B showed a leveling-off for the same period and then slight regression from May, 1958, to September, 1958. The trend of Group C indicated progress for the first five ratings, then a leveling-off of progress from the fifth to the sixth rating (January, 1959, to May, 1959).

The quartic component, shown in Table 14 (item C-4), indicates that the three experimental groups differed significantly with respect to the differences in their trends for the first half of each year compared with those of the last half.

(h-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 14 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the two-year period.

i. Music

(i-1) Progress of the Experimental Groups as a Whole. The linear component of the over-all trend, between trials, shown in Table 15

TABLE 15

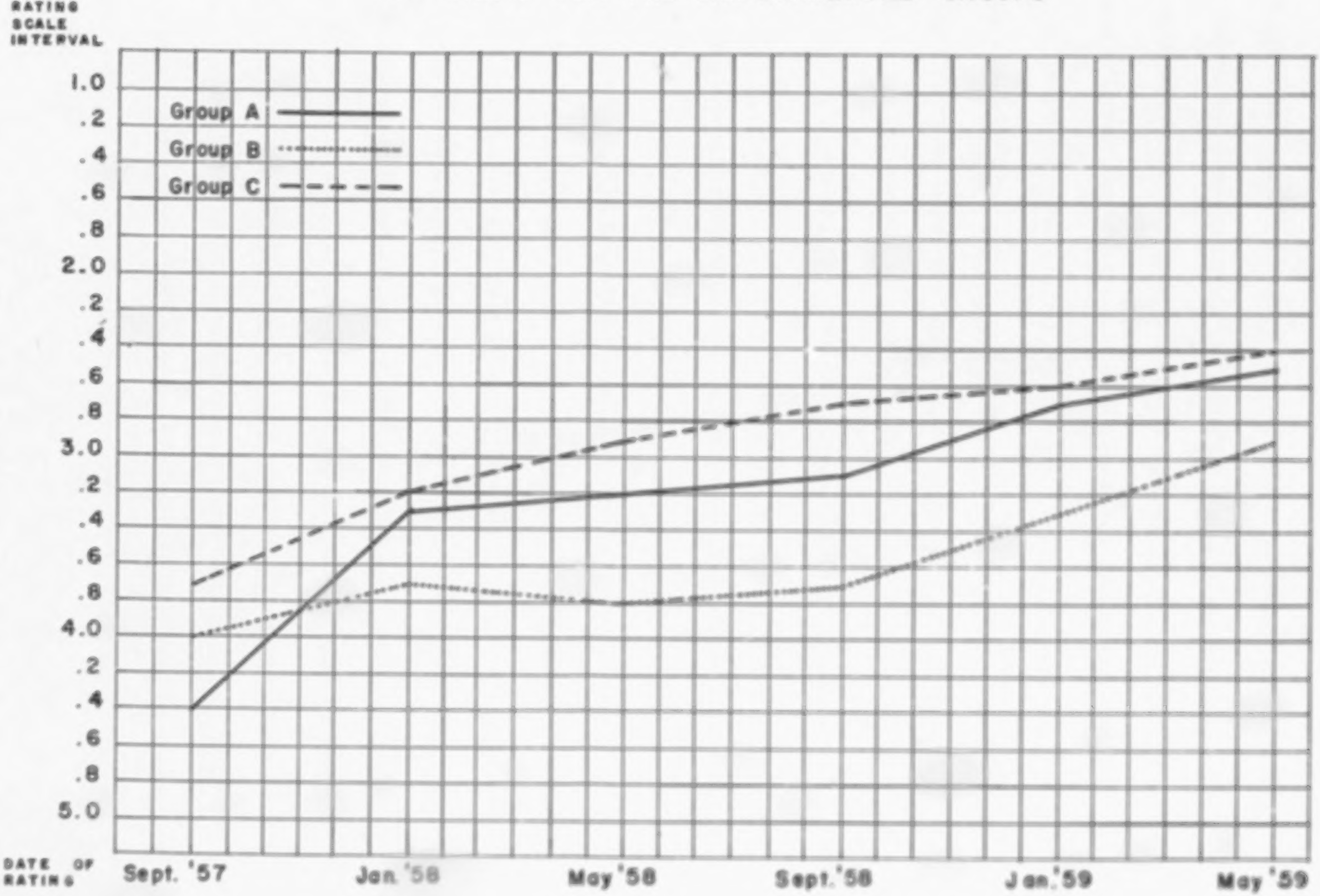
SUMMARY OF TREND ANALYSIS OF THE SIX RATINGS ON THE SCALE OF MUSIC FOR THE EXPERIMENTAL GROUPS

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	59.90	.001
1. Linear	121.26	.001
2. Quadratic	17.25	.001
3. Cubic	7.89	.05
4. Quartic	12.60	.01
5. Quintic	0.00	n. s.
B. Between Group Means	1.40*	n. s.
C. Between Group Trends	--	--
1. Linear	2.16*	n. s.
2. Quadratic	16.51*	.001
3. Cubic	.78*	n. s.
4. Quartic	1.79*	n. s.
5. Quintic	.03*	n. s.
D. Between Individual Means	10.00	.001

*Analysis of Covariance

FIGURE 9

GROUP MEANS OF THE SIX RATINGS ON THE SCALE OF MUSIC FOR THE EXPERIMENTAL GROUPS



(item A-1), of the three experimental groups as a whole indicates that the average ratings changed significantly over the two-year period. Figure 9 shows that the change was in the direction of improvement.

The quadratic component of the over-all trend, between trials, as may be seen in Table 15 (item A-2), for the experimental groups as a whole indicates that the trend for the first year was significantly different from that of the second year. Figure 9 shows that more progress was made during the first year than during the second year.

Although there was significant progress made by the experimental groups as a whole in the area of music, the significance of the cubic component, shown in Table 15 (item A-3), indicates that the groups as a whole experienced regression at times during the two-year period.

The significance of the quartic component of the over-all trend, between trials, shown in Table 15 (item A-4), indicates that the changes in the average performance of the experimental groups as a whole for the first half of each year were significantly different from those of the last half of each year. Figure 9 shows that more progress was made during the first half of each year than during the last half of each year.

(i-2) Comparison Between Average Over-all Performance of the Groups. Although the between group means of the trend analysis indicated a difference in the level of average performance for the two-year period, an analysis of covariance, shown in Table 15 (item B), controlling for differences between the groups in mental age, indicates that there was no significant difference in the level of average performance between groups. Thus, it appears that the original difference between the groups can be accounted for by differences between the groups in mental age.

(i-3) Comparisons Between Progress of the Experimental Groups. The quadratic component of the analysis of covariance, as may be seen in Table 15 (item C-2), indicates that the trend of the groups differed significantly in relation to the amount of change in performance during the first year compared with that during the second year. An examination of Figure 9 shows that Groups A and C progressed more the first year than the second year, while Group B progressed more the second year.

Although the groups differed significantly in relation to the quartic component on the trend analysis, the analysis of covariance, as shown in Table 15 (item C-4), controlling for differences between the groups in mental age, indicates there was no significant difference between the groups in relation to the quartic component. It appears, therefore, that the difference indicated by the trend analysis can be accounted for by differences between the groups in mental age.

(i-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 15 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the two-year period.

2. Experimental and Control Groups

a. Social Adjustment

(a-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend of the trend analysis, as may be seen in Table 16 (item A-1), for the three ratings on the scale of Social Adjustment indicates the average performance of the four groups as a whole changed significantly. Figure 10 shows the change was in the direction of improvement.

The significance of the quadratic component of the over-all trend of the trend analysis, shown in Table 16 (item A-2), indicates the trend for the first half of the period spanned by the three ratings was significantly different from that of the last half. Examination of Figure 10 indicates the four groups as a whole made less progress during the first half of the period than during the last half. This trend would be expected since the first half of the time spanned a period of training and a period of regression, the summer when the training program was not operated, while the second half spanned only a period of training.

(a-2) Comparison of the Average Over-all Performance of the Groups. The between group means of the analysis of covariance, shown

TABLE 16

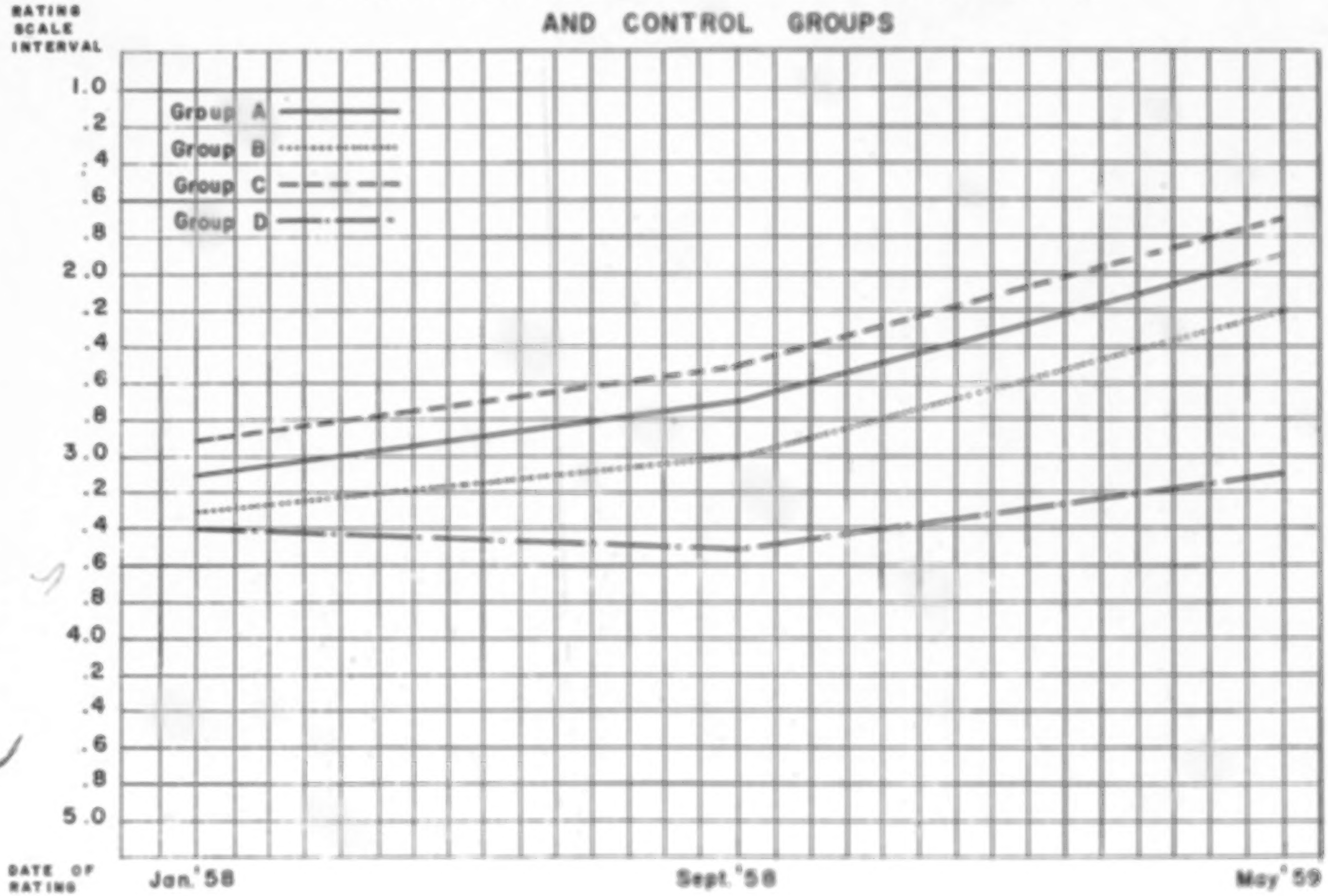
SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF SOCIAL ADJUSTMENT FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	123.00	.001
1. Linear	194.71	.001
2. Quadratic	22.40	.001
B. Between Group Means	6.60*	.01
C. Between Group Trends	--	--
1. Linear	9.50*	.001
2. Quadratic	.57*	n.s.
D. Between Individual Means	9.33	.001

*Analysis of Covariance

FIGURE 10

GROUP MEANS ON THREE RATINGS ON THE SCALE OF SOCIAL ADJUSTMENT FOR THE EXPEPIMENTAL AND CONTROL GROUPS



in Table 16 (item B), indicate a significance difference between the level of the average performance of the four groups. Figure 10 shows that the trends of the average performance for the three experimental groups, A, B, and C, during the time spanned by the three ratings was clearly above that of the control group, D.

(a-3) Comparison Between Progress of the Various Groups. The linear component of the between group trends of the analysis of covariance, shown in Table 16 (item C-1), indicates that the four groups progressed at significantly different rates.

(a-4) Comparison Between Progress of Individuals. The between group means of the trend analysis, shown in Table 16 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

b. Self Care

(b-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend, as may be seen in Table 17 (item A-1), for the three ratings on the scale of Self Care indicates the trend for the four groups as a whole changed significantly. Examination of Figure 11 shows that the direction of the change in average performance was one of improvement.

The quadratic component of the over-all trend, shown in Table 17 (item A-2), indicates the first half of the trend for the four groups as a

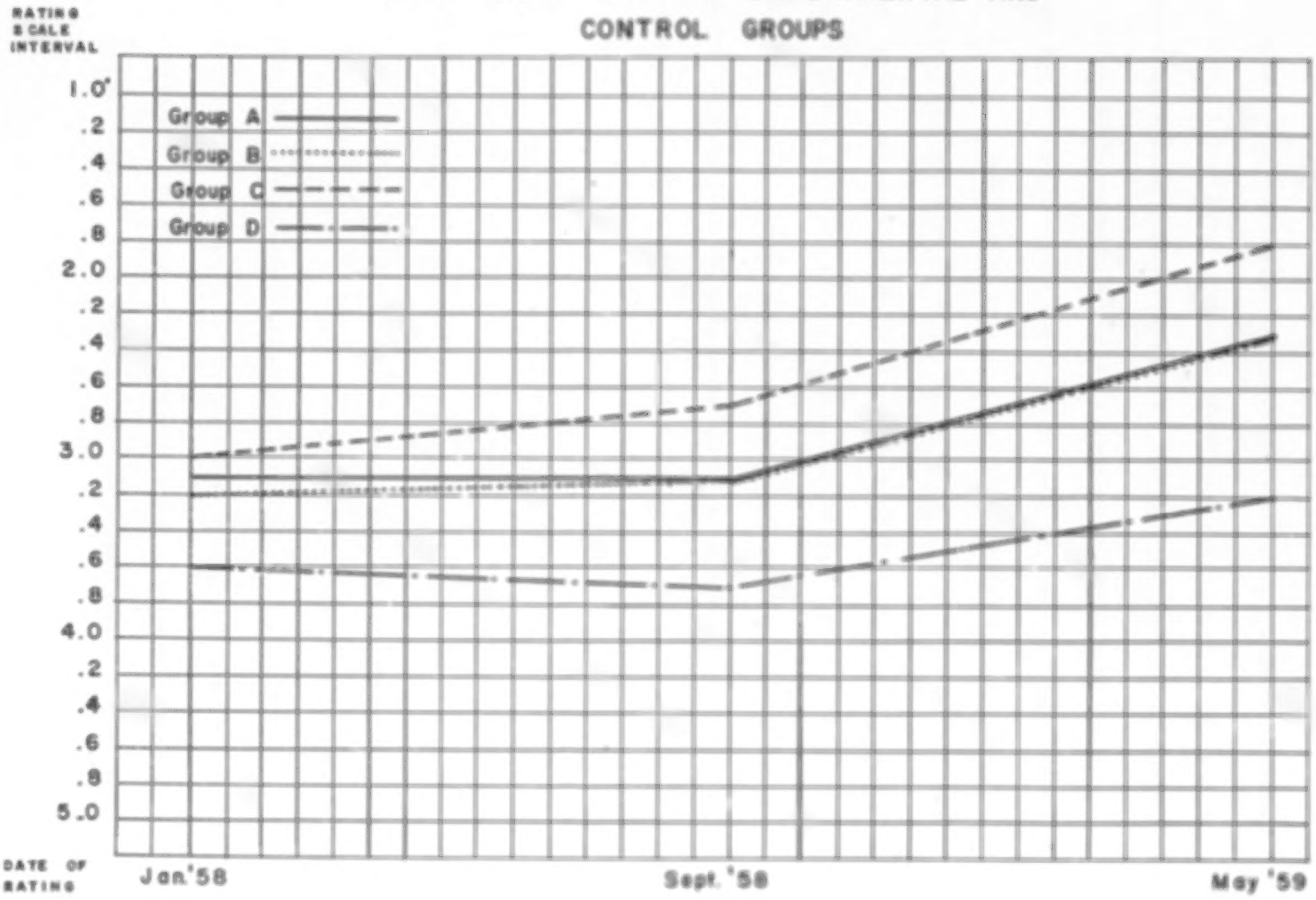
TABLE 17

SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF SELF CARE FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	122.20	.001
1. Linear	144.14	.001
2. Quadratic	71.00	.001
B. Between Group Means	4.68	.05
C. Between Group Trends	4.00	.01
1. Linear	5.43	.01
2. Quadratic	.67	n.s.
D. Between Individual Means	16.40	.001

FIGURE II

GROUP MEANS ON THREE RATINGS ON THE SCALE OF SELF CARE FOR THE EXPERIMENTAL AND CONTROL GROUPS



whole was significantly different from that of the last half. Figure 11 shows that less progress was made during the first half of the training period than during the last half. This trend would be expected since the first half of the time spanned a period of training and a period of regression, the summer when the training program was not operated, while the second half spanned only a period of training.

(b-2) Comparison of the Average Over-all Performance of the Groups. The between group means of the trend analysis, shown in Table 17 (item B), tend to indicate the groups differed significantly in relation to the level of their average performance. Inspection of Figure 11 shows that the average performance during the time spanned by the three ratings of the three experimental groups, A, B, and C, was above that of the control group, D.

(b-3) Comparison Between Progress of the Various Groups. The significance of the linear component of the between group trends, shown in Table 17 (item C-1), indicates that the changes in average performance for each group during the one and one-half-year period were made at significantly different rates.

(b-4) Comparison Between Progress of Individuals. The between group means, as may be seen in Table 17 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

c. Language Development

(c-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend, between trials, of the trend analysis, shown in Table 18 (item A-1), for the Language Development Scale indicates that the trend for the average performance of the four groups as a whole changed significantly during the time spanned by the three ratings. Figure 12 shows that the change was in the direction of improvement.

(c-2) Comparison of the Average Over-all Performance of the Groups. The between group means of the analysis of covariance, as may be seen in Table 18 (item B), indicate a significant difference between the level of average performance of the four groups. Inspection of Figure 12 shows that the average performance of the experimental groups, A, B, and C, was above that of the control group, D.

(c-3) Comparison Between Progress of the Various Groups. The linear component of the between group trends of the covariance, as shown in Table 18 (item C-1), indicates that the groups progressed at significantly different rates.

(c-4) Comparison Between Progress of Individuals. The between individual means for the trend analysis, shown in Table 18 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

TABLE 18

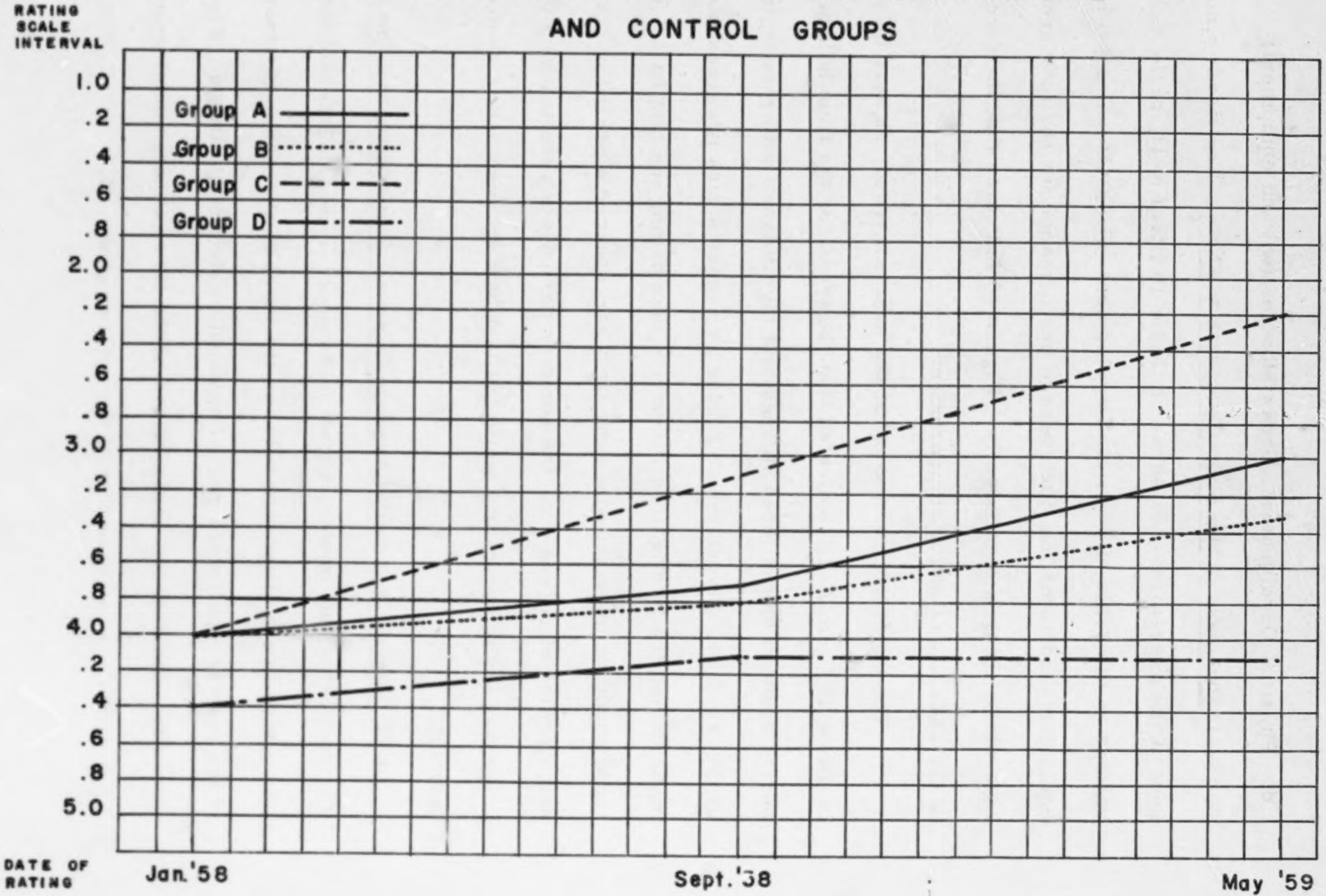
SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF LANGUAGE DEVELOPMENT FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	143.00	.001
1. Linear	284.20	.001
2. Quadratic	2.00	n.s.
B. Between Group Means	12.28*	.001
C. Between Group Trends	--	--
1. Linear	23.50*	.001
2. Quadratic	1.34*	n.s.
D. Between Individual Means	12.60	.001

* Analysis of Covariance

FIGURE 12

GROUP MEANS ON THREE RATINGS ON THE SCALE OF LANGUAGE DEVELOPMENT FOR THE EXPERIMENTAL AND CONTROL GROUPS



d. Physical Development, Gross Muscles (without equipment)

(d-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend, shown in Table 19 (item A-1), of the three ratings on the scale of Physical Development, Gross Muscles (without equipment) indicates that the average performance for the four groups as a whole changed significantly. Figure 13 indicates that the direction of the change was one of improvement.

The quadratic component of the over-all trend, as may be seen in Table 19 (item A-2), indicates that the trend for the first half of the period spanned by the three ratings was significantly different from that of the last half. Inspection of Figure 14 suggests less progress was made during the first half of the period than during the last half. This trend would be expected since the first half spanned a period of training and a period of regression, the summer period when the training program was not in operation, while the last half spanned only a period of training.

(d-2) Comparison of the Average Over-all Performance of the Groups. The between group means, shown in Table 19 (item B), indicate there was a significant difference between the level of average performance of the four groups for the period spanned by the three ratings. Figure 13 shows that the average performance of the three experimental groups, A, B, and C, was above that of the control group, D.

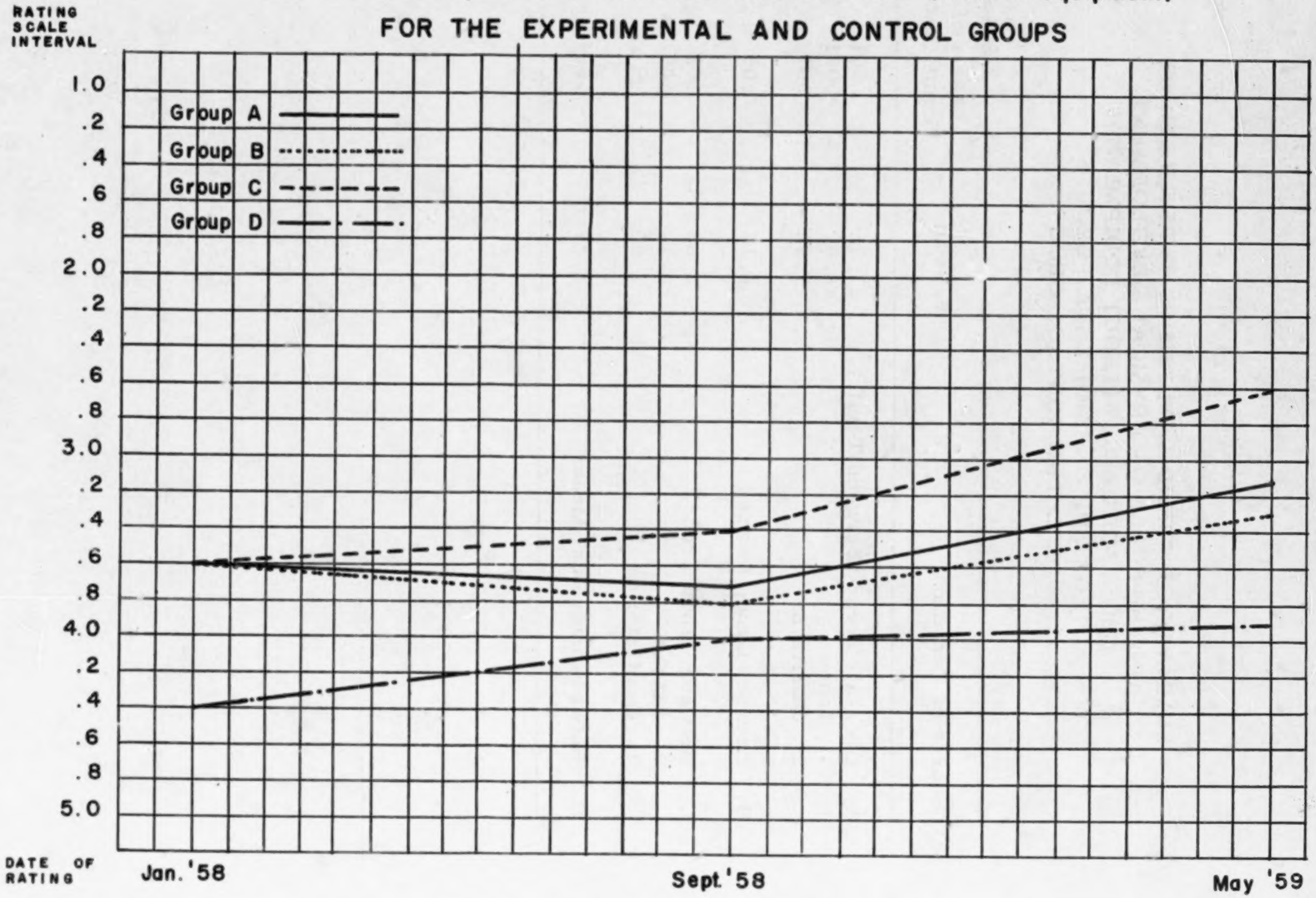
TABLE 19

SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLES (WITHOUT EQUIPMENT) FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	27.72	.001
1. Linear	46.91	.001
2. Quadratic	7.83	.01
B. Between Group Means	4.14	.05
C. Between Group Trends	2.64	.05
1. Linear	3.18	.05
2. Quadratic	2.00	n.s.
D. Between Individual Means	6.27	.001

FIGURE 13

GROUP MEANS ON THREE RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLE ACTIVITIES (without equipment) FOR THE EXPERIMENTAL AND CONTROL GROUPS



(d-3) Comparison Between Progress of the Various Groups. The linear component of the between group trends, as shown in Table 19 (item C-1), tends to indicate that the four groups progressed at significantly different rates.

(d-4) Comparison Between Progress of Individuals. The between individual means, as may be seen in Table 19 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

e. Physical Development, Gross Muscles (with equipment)

(e-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend, shown in Table 20 (item A-1), indicates that the over-all pattern of the average performance on the three ratings of the four groups as a whole changed significantly during the time spanned by the three ratings. Figure 14 shows this change was in the direction of improvement.

(e-2) Comparison of the Average Over-all Performance of the Groups. The between group means, as may be seen in Table 20 (item B), indicates that there was a significant difference between the level of average performance of the four groups. It appears, from Figure 14, that the average performance of the two experimental groups A and B was clearly above that of the control group D, and that the average

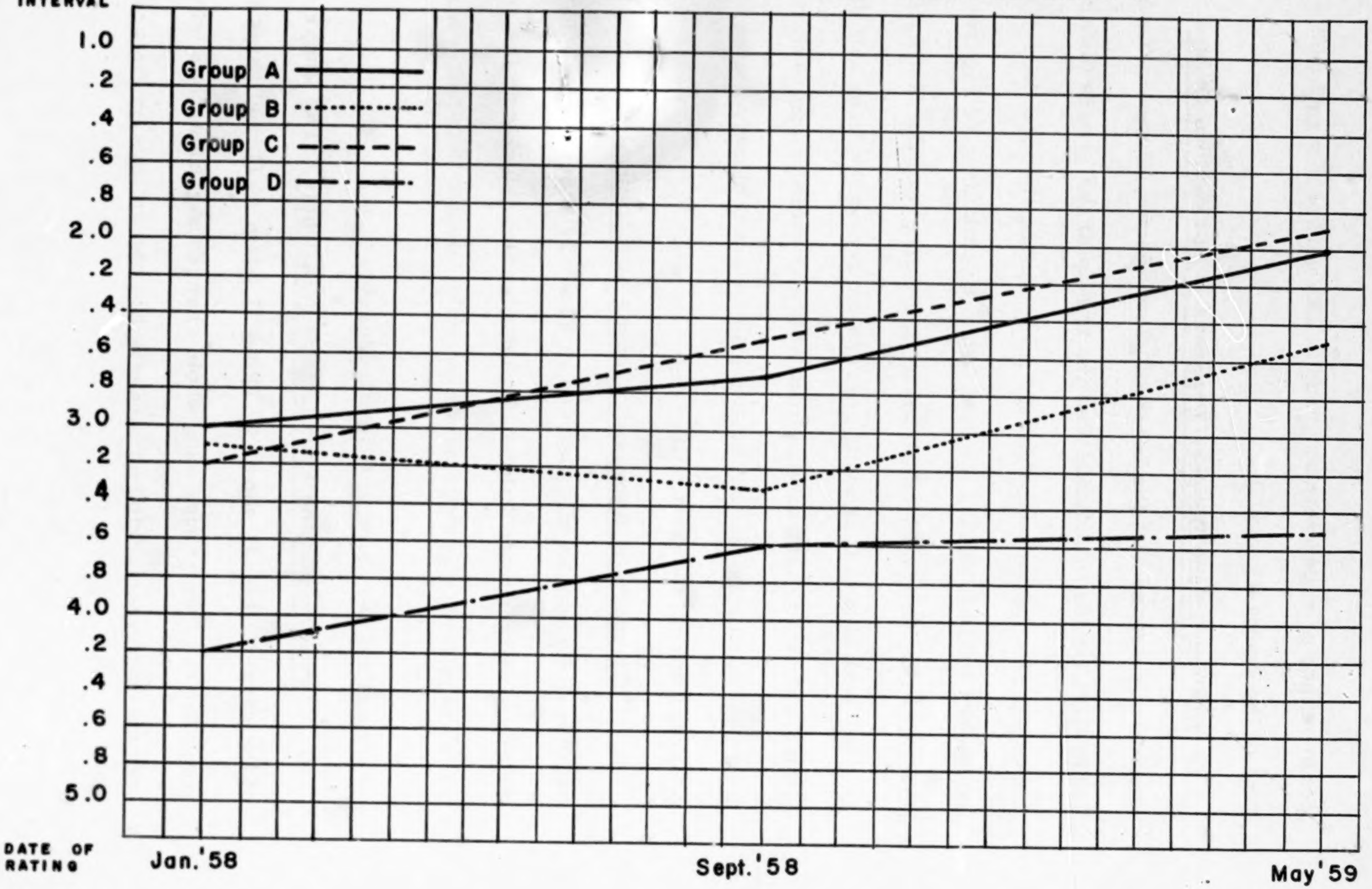
TABLE 20

SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLES (WITH EQUIPMENT), FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	43.87	.001
1. Linear	86.47	.001
2. Quadratic	1.20	n. s.
B. Between Group Means	9.11	.001
C. Between Group Trends	2.93	.05
1. Linear	2.80	n. s.
2. Quadratic	3.07	.05
D. Between Individual Means	5.00	.001

FIGURE 14

GROUP MEANS ON THREE RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, GROSS MUSCLE ACTIVITIES (with equipment) FOR THE EXPERIMENTAL AND CONTROL GROUPS



performance of experimental group C was probably significantly above that of the control group D.

(e-3) Comparison Between Progress of the Various Groups. The quadratic component of the between group trends, shown in Table 20 (item C-2), tends to indicate that the trends of the groups differed significantly in relation to the change made during the first half of the period compared to those during the last half. Examination of Figure 14 clearly indicates that Groups A and B made more progress the last half of the period, with Group B showing regression during the first half of the period. Group C showed approximately the same progress during the first half as during the last half, while Group D clearly showed more progress during the first half.

(e-4) Comparison Between Progress of Individuals. The between individual means, as may be seen in Table 20 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

f. Physical Development, Small Muscles

(f-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend, shown in Table 21 (item A-1), indicates that the trend for the four groups as a whole changed significantly during the one and one-half-year period as measured by the ratings on the scale of

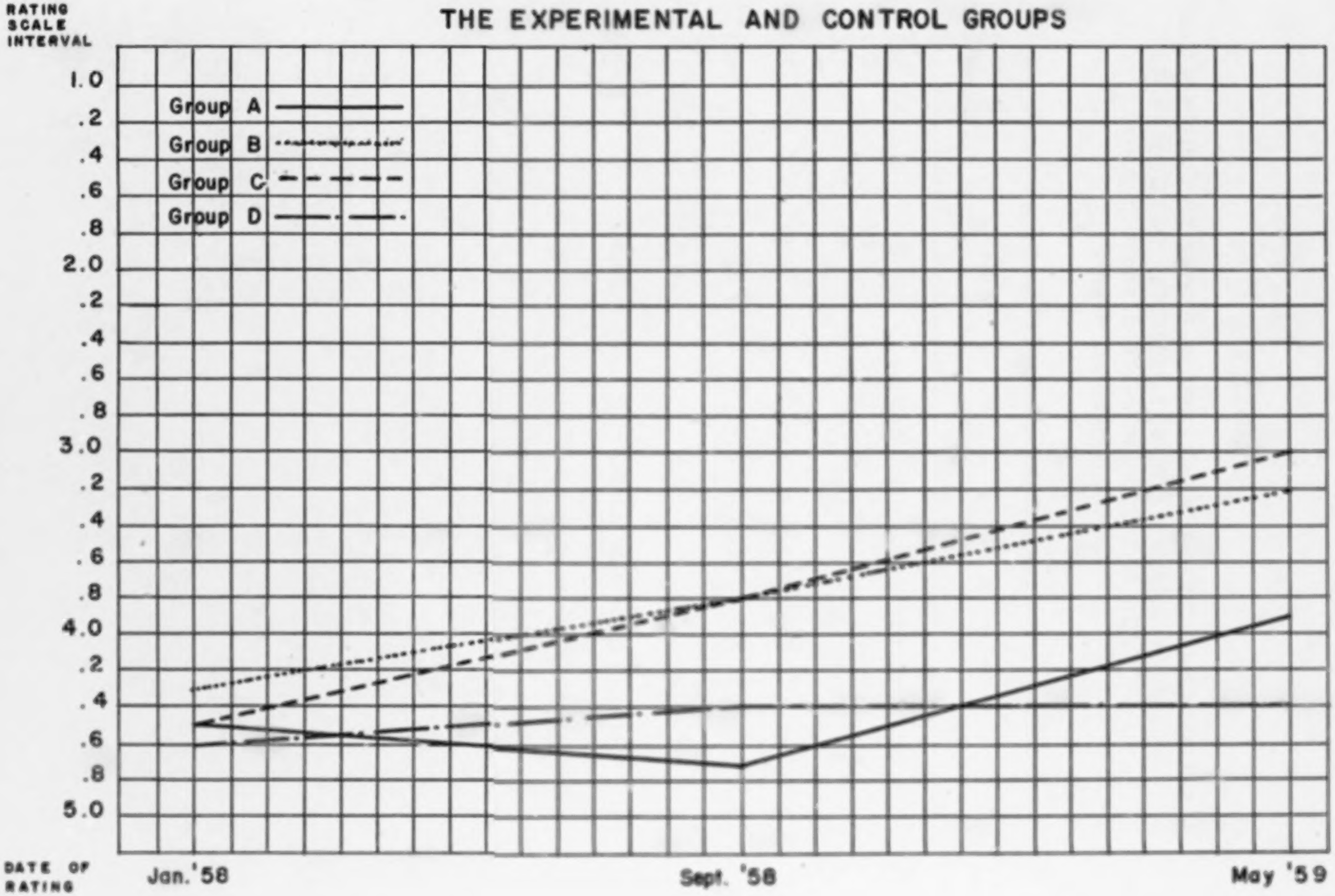
TABLE 21

SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, SMALL MUSCLES FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	73.25	.001
1. Linear	125.22	.001
2. Quadratic	7.50	.01
B. Between Group Means	3.44	.05
C. Between Group Trends	9.75	.001
1. Linear	12.89	.001
2. Quadratic	6.67	.01
D. Between Individual Means	11.25	.001

FIGURE 15

GROUP MEANS ON THREE RATINGS ON THE SCALE OF PHYSICAL DEVELOPMENT, SMALL MUSCLE ACTIVITIES FOR THE EXPERIMENTAL AND CONTROL GROUPS



Physical Development, Small Muscles. Figure 15 shows that the changes in the average performance was in the direction of improvement.

The significance of the quadratic component, shown in Table 21 (item A-2), indicates that the trend for the four groups as a whole for the first half of the period spanned by the three ratings was significantly different from that of the last half. Figure 15 suggests less progress was made during the first half of the period than during the last half.

(f-2) Comparison of the Average Over-all Performance of the Groups. The between group means, shown in Table 21 (item B), indicate a significant difference in the level of average performance of the four groups. Figure 15 shows that the average performance of the experimental groups B and C was above that of the control group D. Also, Figure 15 suggests that the average performance of experimental group A was possibly significantly above that of the control group D; however, such a difference is not clearly indicated.

(f-3) Comparisons Between Progress of the Various Groups. The linear component of the between group trends, as may be seen in Table 21 (item C-1), indicates that the four groups progressed at significantly different rates.

The quadratic component of the between group trends, as shown in Table 21 (item C-2), indicates that the groups differed significantly in relation to the changes in their respective trends during the first half of the period compared to that during the last half. Figure 15 shows that Groups A, B, and C made more progress during the last half of the period, while Group D made more progress during the first half.

(f-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 21 (item D), indicate that there were significant differences between the individuals in their over-all average level of performance over the one and one-half-year period.

g. Arts and Crafts

(g-1) Progress of the Four Groups as a Whole. The linear component, shown in Table 22 (item A-1), indicates that the over-all pattern of the average performance for the four groups as a whole changed significantly during the one and one-half years in the area of arts and crafts. Examination of Figure 16 shows that the change in performance was in the direction of improvement.

The significance of the quadratic component, shown in Table 22 (item A-2), indicates the trend for the first half of the period was significantly different from that of the last half. Figure 16 shows that less progress was made during the first half than during the last half.

(g-2) Comparison of the Average Over-all Performance of the Groups. The significance of the between group means, as may be seen in Table 22

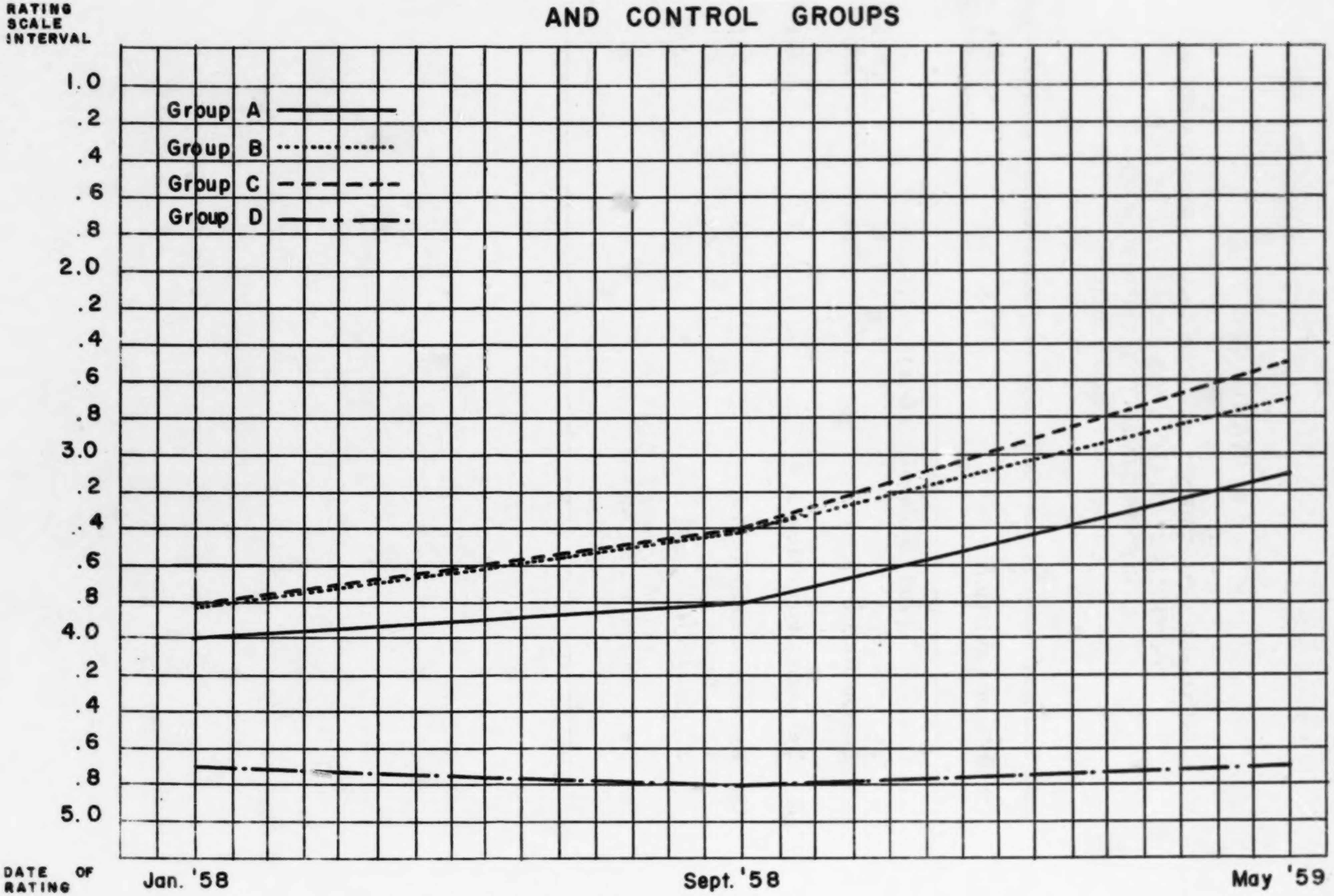
TABLE 22

SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF ARTS AND CRAFTS FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	82.86	.001
1. Linear	152.43	.001
2. Quadratic	13.14	.01
B. Between Group Means	19.17	.001
C. Between Group Trends	8.43	.001
1. Linear	16.29	.001
2. Quadratic	.57	n.s.
D. Between Individual Means	7.57	.001

FIGURE 16

GROUP MEANS ON THREE RATINGS ON THE SCALE OF ARTS AND CRAFTS FOR THE EXPERIMENTAL AND CONTROL GROUPS



(item B), indicates that there was a difference between the level of the average performance of the four groups. Figure 16 shows that the average performance of the three experimental groups was above that of the control group.

(g-3) Comparison Between Progress of the Various Groups. The linear component of the between group trends, shown in Table 22 (item C-1), indicates that the four groups progressed at significantly different rates.

(g-4) Comparison Between Progress of Individuals. The between individual means, as shown in Table 22 (item D), indicates that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

h. Economic Usefulness

(h-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend, shown in Table 23 (item A-1), indicates that the over-all pattern of average performance for the four groups on the three ratings changed significantly. An examination of Figure 17 indicates that the change was in the direction of improvement.

The quadratic component, shown in Table 23 (item A-2), tends to indicate that the over-all trend of the average performance for the first half of the period spanned by the three ratings was significantly different from that of the last half. Figure 17 suggests less progress

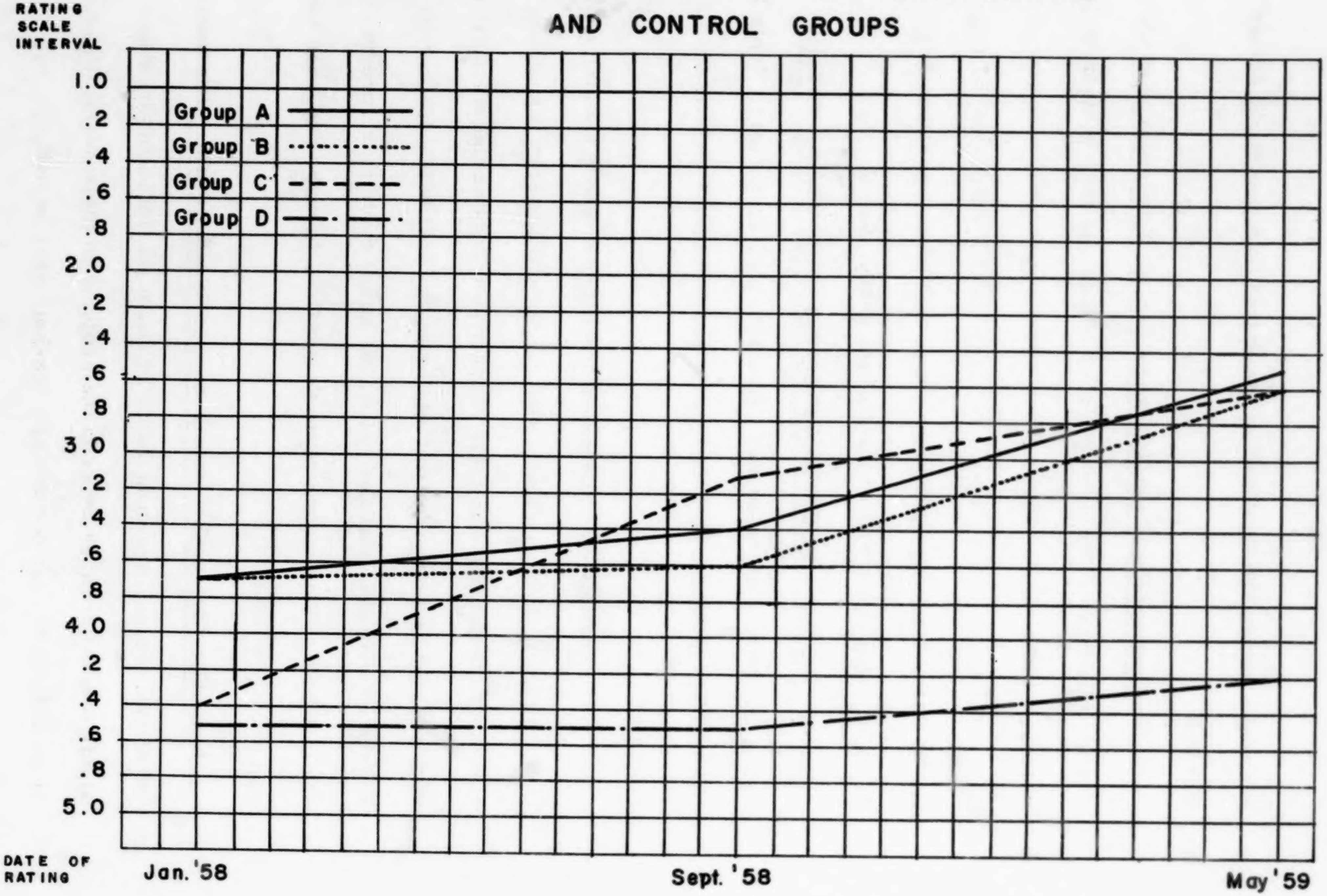
TABLE 23

SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF ECONOMIC USEFULNESS FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	163.50	.001
1. Linear	276.86	.001
2. Quadratic	4.60	.05
B. Between Group Means	14.20	.001
C. Between Group Trends	18.17	.001
1. Linear	22.57	.001
2. Quadratic	11.80	.001
D. Between Individual Means	7.67	.001

FIGURE 17

GROUP MEANS ON THREE RATINGS ON THE SCALE OF ECONOMIC USEFULNESS FOR THE EXPERIMENTAL AND CONTROL GROUPS



was made during the first half of the period than was made during the last half.

(h-2) Comparison of the Average Over-all Performance of the Groups. The significance of the between group means, as may be seen in Table 23 (item B), indicates the four groups were significantly different in relation to the level of their average performance. Inspection of Figure 17 shows that the average performance of the three experimental groups, A, B, C, was above that of the control group, D.

(h-3) Comparisons Between Progress of the Various Groups. The linear component of the between group trends, as shown in Table 23 (item C-1), indicates that the groups progressed at significantly different rates.

The quadratic component of the between group trends, shown in Table 23 (item C-2), indicates that the groups differed significantly in relation to the changes in their respective trends during the first half of the period as compared to that during the last half. Inspection of Figure 17 indicates that Groups A, B, and D made more progress during the last half of the period, while Group C made more progress the first half.

(h-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 23 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

i. Music

(i-1) Progress of the Four Groups as a Whole. The linear component of the over-all trend of the trend analysis, shown in Table 24 (item A-1), indicates that the average performance of the four groups as a whole changed significantly in the area of music as indicated by the three ratings. Figure 18 shows that the change was in the direction of improvement.

(i-2) Comparison of the Average Over-all Performance of the Groups. The between group means of the analysis of covariance, as may be seen in Table 24 (item B) indicates that the level of the average performance of the four groups differed significantly. It appears, from Figure 18, that the average performance of the experimental groups A and C was clearly above that of the control group D, and possibly the average performance of the experimental group C was above that of the control group D.

(i-3) Comparison Between Progress of Individuals. The Between individual means of the trend analysis, shown in Table 24 (item D), indicate that there were significant differences between the subjects in their over-all average level of performance over the one and one-half-year period.

(i-4) Comparison Between Progress of Individuals. The between individual means, shown in Table 24 (item D), indicate that there were

TABLE 24

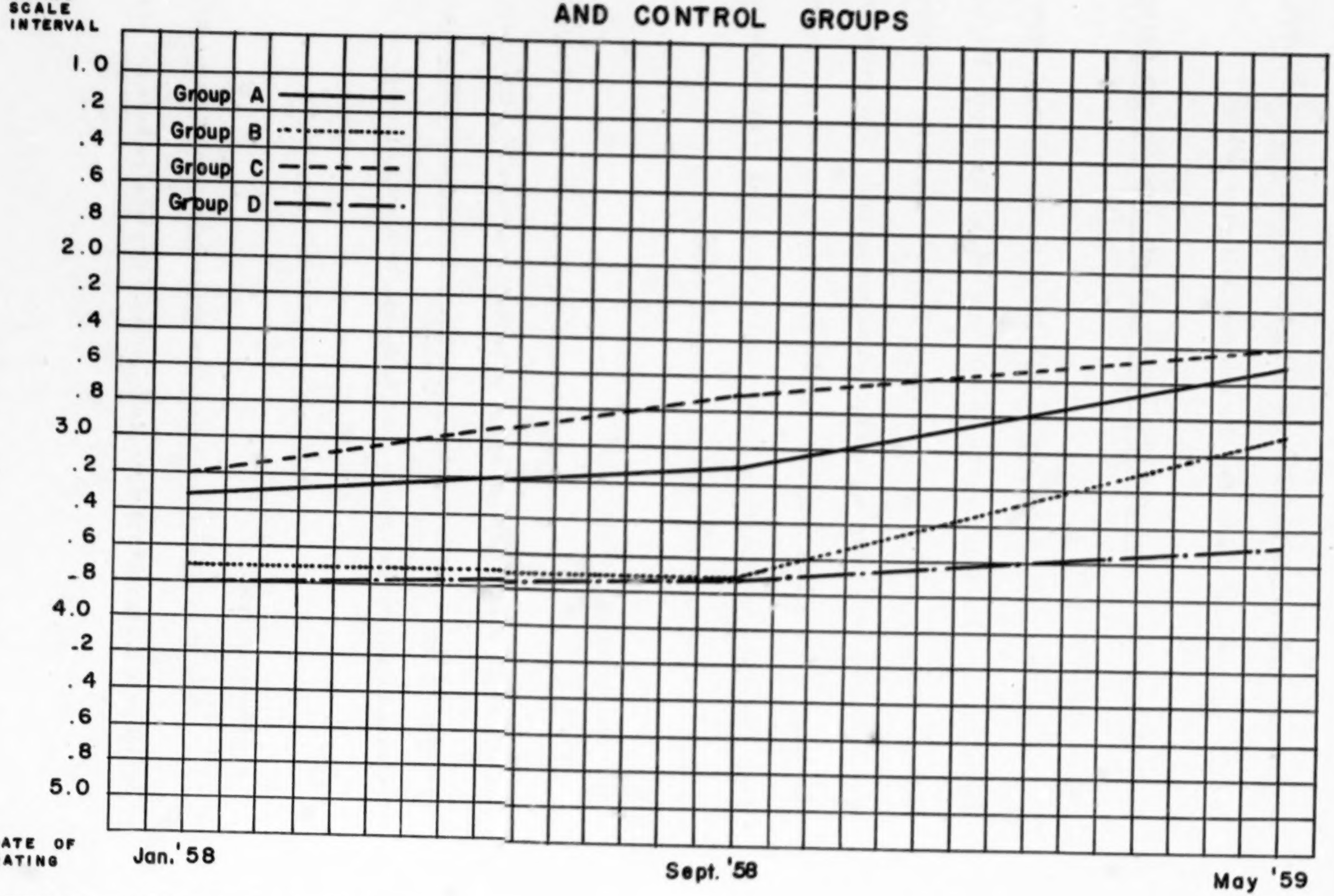
SUMMARY OF TREND ANALYSIS OF THREE RATINGS ON THE SCALE OF MUSIC FOR THE EXPERIMENTAL GROUPS AND THE CONTROL GROUP

Source of Variation	F Ratio	Levels of Significance
A. Over-all Trend (Between Trials)	11.76	.001
1. Linear	34.74	.001
2. Quadratic	2.75	n.s.
B. Between Group Means	4.99*	.01
C. Between Group Trends	--	--
1. Linear	1.55*	n.s.
2. Quadratic	2.11*	n.s.
D. Between Individual Means	2.28	.05

*Analysis of Covariance

FIGURE 18

GROUP MEANS ON THREE RATINGS ON THE SCALE OF MUSIC FOR THE EXPERIMENTAL AND CONTROL GROUPS



significant differences between the subjects in their over-all average level of performance over the one and one-half year period.

3. Experimental Population Classified According to Various Categories.

a. Mongoloid

The U values of the difference scores for the ratings, shown in Table 25, indicate a difference on only one scale, Economic Usefulness, between the progress of those trainable children classified as mongoloid and those who were not classified as mongoloid. The average for the sums of the ranks indicate that the average progress of those children classified as mongoloid tended to be above that of those not classified as mongoloid in the area of economic usefulness.

b. Neurological Involvement

There were no significant differences, as shown in Table 26, on any scale between the average progress, revealed by the difference scores, of those children with medically established neurological involvement and those without medically established neurological involvement.

c. Hyperactivity

The U values of the difference scores, shown in Table 27, tend to indicate a significant difference on only two scales between the progress

TABLE 25

PROGRESS OF THOSE CHILDREN CLASSIFIED AS MONGOLOID COMPARED WITH THE PROGRESS OF THOSE NOT CLASSIFIED AS MONGOLOID

Area of Training	Sum of Ranks		Value of U	Level of Significance
	Mongoloid N 9	Not Mongoloid N 14		
Social Adjustment	128.50	147.50	42.50	n. s.
Self Care	126.00	150.00	45.00	n. s.
Language Development	112.00	164.00	59.00	n. s.
Physical Development, Gross Muscles (Without Equipment)	105.00	171.00	60.00	n. s.
Physical Development, Gross Muscles (With Equipment)	131.00	145.00	40.00	n. s.
Physical Development, Small Muscles	120.50	155.50	50.50	n. s.
Arts and Crafts	130.00	146.00	41.00	n. s.
Economic Usefulness	137.00	139.00	34.00	.05
Music	89.50	186.50	44.50	n. s.

TABLE 26

PROGRESS OF THOSE CHILDREN WITH NEUROLOGICAL INVOLVEMENT COMPARED WITH THE PROGRESS OF THOSE WITHOUT NEUROLOGICAL INVOLVEMENT

Area of Training	Sum of Ranks		Value of U	Level of Significance
	With Neurological Involvement N 18	Without Neurological Involvement N 5		
Social Adjustment	207.00	69.00	36.00	n. s.
Self Care	202.50	73.50	31.50	n. s.
Language Development	223.50	52.50	37.50	n. s.
Physical Development, Gross Muscles (Without Equipment)	207.50	68.50	36.50	n. s.
Physical Development, Gross Muscles (With Equipment)	205.00	71.00	34.00	n. s.
Physical Development, Small Muscles	215.00	61.00	44.00	n. s.
Arts and Crafts	215.00	61.00	44.00	n. s.
Economic Usefulness	207.00	69.20	36.00	n. s.
Music	225.00	51.00	36.00	n. s.

TABLE 27

PROGRESS OF THOSE CHILDREN OBSERVED AS HYPERACTIVE COMPARED WITH THE PROGRESS OF THOSE NOT OBSERVED AS HYPERACTIVE

Area of Training	Sum of Ranks		Value of U	Level of Significance
	Hyperactive N 6	Not Hyperactive N 17		
Social Adjustment	86.00	190.00	37.00	n.s.
Self Care	48.50	227.50	27.50	n.s.
Language Development	60.50	215.50	39.50	n.s.
Physical Development, Gross Muscles (Without Equipment)	84.00	192.00	39.00	n.s.
Physical Development, Gross Muscles (With Equipment)	58.00	218.00	37.00	n.s.
Physical Development, Small Muscles	50.50	225.50	29.50	n.s.
Arts and Crafts	44.00	232.00	23.00	.05
Economic Usefulness	38.50	237.50	17.50	.05
Music	92.50	183.50	30.50	n.s.

of those children observed as hyperactive and those not observed as hyperactive. These scales were Economic Usefulness and Arts and Crafts. The average for the sums of the ranks of the difference scores for both of these scales suggest that the average progress of the children who were not classified as hyperactive was above that of those classified as hyperactive.

d. Physical Handicaps

The U values of the difference scores, shown in Table 28, indicate a significant difference on the scales of Physical Development, Small Muscles; Arts and Crafts; and Music between the progress of those children observed as having physical handicaps and those not having physical handicaps. The average of the sums of the ranks for the difference scores suggests that those children without physical handicaps progressed more in the areas of physical development, small muscles, and arts and crafts. Those with physical handicaps, however, made more progress in the area of music.

e. Language Handicap

The U values of the difference scores, as shown in Table 29, indicate a significant difference in the area of language development between the progress of those children observed as having a language handicap and those without a language handicap. The average for the sum of

TABLE 28

PROGRESS OF THOSE CHILDREN WITH PHYSICAL HANDICAP COMPARED WITH THE PROGRESS OF THOSE WITHOUT PHYSICAL HANDICAP

Area of Training	Sum of Ranks		Value of U	Level of Significance
	Physical Handicap N 6	Without Physical Handicap N 17		
Social Adjustment	77.00	199.00	46.00	n. s.
Self Care	69.00	206.50	48.50	n. s.
Language Development	68.50	207.50	47.50	n. s.
Physical Development, Gross Muscles (Without Equipment)	71.00	205.00	50.00	n. s.
Physical Development, Gross Muscles (With Equipment)	49.00	227.00	28.00	n. s.
Physical Development, Small Muscles	37.50	238.50	16.50	.01
Arts and Crafts	46.50	229.50	25.50	.05
Economic Usefulness	60.00	216.00	39.00	n. s.
Music	107.50	168.50	15.00	.01

TABLE 29

PROGRESS OF THOSE CHILDREN WITH LANGUAGE HANDICAP COMPARED WITH THE PROGRESS OF THOSE WITHOUT LANGUAGE HANDICAP

Area of Training	Sum of Ranks		Value of U	Level of Significance
	With Language Handicap N 11	Without Language Handicap N 12		
Social Adjustment	137.50	138.50	60.50	n. s.
Self Care	119.50	156.50	53.50	n. s.
Language Development	82.50	193.50	16.50	.001
Physical Development, Gross Muscles (Without Equipment)	138.00	138.00	60.00	n. s.
Physical Development, Gross Muscles (With Equipment)	122.00	154.00	56.00	n. s.
Physical Development, Small Muscles	124.00	152.00	58.00	n. s.
Arts and Crafts	115.50	160.50	49.50	n. s.
Economic Usefulness	130.00	146.00	64.00	n. s.
Music	130.00	146.00	64.00	n. s.

the ranks for the difference scores indicate that those children without language handicaps made more progress than did those with language handicaps.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. Summary

1. Introduction

This research was a comparative study of the progress of trainable mentally retarded children in certain areas of training in three experimental environments: public schools, segregated community centers, and state schools. Also, it was desired that this study determine whether one of the above environments was more adequate for the training of this type of child. In addition, an investigation was made of the assumption that trainable children who participate in an organized training program under the direction of competent teachers develop their potential ability more adequately than those children who do not receive such training.

The training program was conducted for two nine-month school terms during the period from September, 1957, to June, 1959. The public school class was operated at Wooldridge Public School, Austin, Texas. The class at a segregated facility was conducted at the Opportunity Center, which is a center operated by the Austin Council for Retarded Children. The class in a state school was conducted at the Austin State School. In addition, there was a control group, the members of which lived at home with their parents and did not participate in an organized training program. The population for each experimental group was stabilized with an N of nine, the control group, with an N of eight. At the end of the two-year period, the population for each group was as follows: the public school group, Group A, nine; the group at the Opportunity Center, Group B, six; the group at the state school, Group C, eight; and the control group, Group D, seven.

The training program included seven areas: social adjustment, self care, language development, physical development, music, arts and crafts, and economic usefulness. Activities or tasks were designed to develop skills and abilities within each area of the curriculum. Teaching methods for every task or activity were developed and the teaching aids and materials for every task or activity were designated so that each teacher could follow the same procedures and use the same types of materials. Lesson plans, designed to utilize all the activities and tasks in all areas, were developed and were followed by each teacher.

A rating scale was constructed to measure individual progress in the various skills and abilities within each of the seven areas of the curriculum. The performance of the members of the experimental groups were rated at six different intervals. The performance of the members of the control group was rated at three intervals.

One average rating was computed in each area for every individual for each rating period. The skills in the area of physical development, however, were divided into three categories, and separate average ratings were computed for every individual for each of the physical development areas. Thus, there was an average rating for every individual for each rating period on nine scales which were used as the basis for the statistical analyses. These scales were: Social Adjustment; Self Care; Language Development; Physical Development, Gross Muscles (without equipment); Physical Development, Gross Muscles (with equipment); Physical Development, Small Muscles; Arts and Crafts; Economic Usefulness; and Music.

2. Differences Between Intelligence Quotients and Social Quotients.

In three cases there was a difference of ten or more points between the results of the Stanford Binet Scale administered at the beginning of the research period and that administered at the end of the period. Two of these changes were increases and one was a decrease. The two which were increases were for subjects of the experimental groups, while that one which was a decrease was for a subject in the control group.

In five cases there was a difference in social quotients based on the Vineland Social Maturity Scale of ten or more points between the scale administered at the beginning of the research and that administered at the end. Four of the differences showed gains, while one showed a decrease. The five scales showing these changes were for subjects in the experimental groups. There were no changes of ten or more points in the social quotients of the population of the control group.

3. Opinionaires

Opinionaires were obtained from the staff of the public school relating to the acceptance of the class for trainable children at that school. These opinionaires indicated that some of the school staff changed their opinions as to the advisability of the class for trainable children being housed in their building. At the end of the two-year period, three of the eleven individuals completing the opinionaires thought the class for trainable children should not be in the public schools. No one tended to think the class disrupted the regular program nor did anyone think the influence of the class was negative. It appeared, also, that the so-called "normal" child tended to accept the trainable child.

4. Results of Progress Ratings

a. Performance of the Experimental Groups in the Nine Areas of Training

(1) Progress of the Experimental Groups as a Whole

(a) The over-all trend of each rating scale for the experimental groups indicated significant progress was made in each area during the two-year period.

(b) The over-all pattern of the average ratings on each scale, except that of Physical Development, Small

Muscles, indicated more progress was made during the first year than during the second year.

(c) Although the over-all patterns of the ratings were ones of improvement, significant regression of plateaus occurred at some time during the two-year period of training on each scale except that of Physical Development, Small Muscles.

(d) On each scale except Language Development the over-all pattern indicated more improvement was made during the first half of each year than during the second half of each year.

(e) Although the over-all trend of all scales was one of improvement, onthree scales, Social Adjustment, Language Development, and Arts and Crafts, the trends tended to show an up-and-down or saw-toothed effect. This effect indicated that the direction of change in performance tended to vary from rating to rating.

(2) Comparisons Between Average Over-all Performances of the Groups

There were only three scales, Social Adjustment, Language Development, and Music, on which the trend analysis indicated a significant difference between the groups in the level of the average performance. Analyses of covariance on these three scales, in which the ratings were adjusted for the differences between the groups in mental age, indicated that the original differences could be accounted for by the differences in mental ages. It appeared, therefore, that the only statistically significant differences in the level of average performance of the experimental groups in the seven areas of training were due to, or at least explainable in terms of, the fact that one group was significantly higher than the others in average mental age. It was not known whether the differences between the teaching procedures of the teachers significantly influenced the average level of performance of the three experimental groups. In Chapter IV, Observations of Teaching Techniques, it was pointed out that the teaching procedures in two of the groups were observed to be at approximately the same level of efficiency. The teaching procedures in one of the groups was observed as slightly less efficient than those of the other two. It was believed that these differences in teaching procedures did not significantly affect the average over-all performance of each group. This opinion, however, was based upon observation.

(3) Comparisons Between Progress of the Experimental Groups

(a) Although the groups made significant progress in each area, on three scales they progressed at significantly different rates. These scales were Physical Development, Gross Muscles (with equipment); Physical Development, Small Muscles; and Arts and Crafts.

(b) In the area of Self Care, Arts and Crafts, and Music the groups differed significantly in relation to their changes in performance for the first year as compared to their changes in performance for the second year.

(c) Although the over-all pattern of performance for each group was one of improvement in each area, on five of the scales the groups differed significantly in relation to the regression or plateaus in their respective trend during the two-year period. These scales were Self Care; Language Development; Physical Development, Gross Muscles (without equipment); Physical Development, Small Muscles; and Economic Usefulness.

(d) On three scales the experimental groups differed significantly with respect to the differences in their respective trend for the first half of each year compared with those of the last half. These scales were Self Care; Physical

Development, Gross Muscles (without equipment); and Economic Usefulness.

(4) Comparison Between Progress of Individuals

The between individual means indicated that there were significant differences between subjects in their over-all average performance over the two-year period.

b. Comparisons between the Experimental and Control Groups in the Nine Areas of Training

(1) Progress of the Four Groups as a Whole

(a) In each area of training the four groups as a whole made significant progress during the one and one-half years.

(b) On six scales the groups progressed less during the first half of the period than during the last half of the period. These scales were Social Adjustment; Self Care; Physical Development, Gross Muscles (without equipment); Physical Development, Small Muscles; Arts and Crafts; and Economic Usefulness.

(2) Comparisons of the Average Over-all Performances of the Groups

There were statistically significant differences between the level of the average performance of the four groups in each area of training as measured by the nine rating scales. The analysis of covariance, which was substituted for the trend analysis, as previously pointed out, on the three scales, Music, Social Adjustment, and Language Development, in which the ratings were adjusted for the differences between the groups in mental age, indicated that the original differences could not be accounted for by differences in mental age. It appeared, therefore, that there were statistically significant differences between the level of average performance of the four groups in each area of training.

(a) The figures on six of the scales of the ratings showed that the experimental groups, A, B, and C, were significantly above that of the control group, D. These scales were Social Adjustment; Self Care; Language Development; Physical Development, Gross Muscles (without equipment); Arts and Crafts; and Economic Usefulness.

(b) The figures on two of the scales, Physical Development, Gross Muscles (with equipment); and Music, indicated that the performance of experimental groups A and B was clearly superior to that of the control group, D, while the performance of experimental group C was probably significantly superior to the control group D.

(c) The figures for the ratings on the scale for Physical Development, Small Muscles, suggested that two of the experimental groups B and C performed better than the control group D, and that possibly the average performance of experimental group A was significantly above that of the control group D; however, this latter significance was not clearly shown.

(3) Comparisons Between Progress of the Various Groups

(a) On seven of the nine scales the groups progressed at significantly different rates. These scales were Social Adjustment; Self Care; Language Development; Physical Development, Gross Muscles (without equipment); Physical Development, Small Muscles; Arts and Crafts; and Economic Usefulness.

(b) On three of the scales the groups differed significantly in relation to their changes in performance for the first half of the training period and that for the last half of the training period. These scales were Physical Development, Gross Muscles (with equipment); Physical Development, Small Muscles; and Economic Usefulness.

(4) Comparison Between Progress of Individuals

There were significant differences between the individuals in their over-all average performance over the two-year period.

c. Progress of the Experimental Subjects Classified According to Various Criteria

(1) Mongoloid

The average progress of those children classified as mongoloid was not significantly different from that of those who were not classified as mongoloid except in the area of economic usefulness. In this area the average progress of the mongoloid children tended to be above that of those who were not mongoloid.

(2) Neurological Involvement

There were no significant differences between the progress of those trainable children with medically established neurological involvements and that of those without medically established neurological involvements.

(3) Hyperactivity

The progress of those children who were classified as hyperactive was not significantly different from that of those not classified as hyperactive except in the areas of economic usefulness and arts and crafts. In these areas those children not classified as hyperactive tended to make more progress.

(4) Physical Handicaps

The average progress of those children observed as having physical handicaps was not significantly different from that of those who were not observed as having physical handicaps except on the scales of Physical Development, Small Muscles; Arts and Crafts; and Music. Those without physical handicaps tended to make more progress on the scales of Physical Development, Small Muscles; and Arts and Crafts. Those with physical handicaps tended to make more progress in the area of music.

(5) Language Handicaps

There was a significant difference between the progress of the trainable children classified as having a language handicap and that of those not having a language handicap in the area of language development. In this area those children without language handicap made more progress.

B. Conclusions

1. Conclusions Pertaining to Hypotheses

a. Introduction

In the discussion of the hypotheses, a decision to "accept" a hypothesis was made with the realization that it was made with some risk, i.e., all that was implied was that there was not enough evidence in this study to reject the hypothesis. A decision to "reject" a hypothesis implied only a rejection of the hypothesis for this study.

b. Hypotheses 1-a and 1-b

The findings of this study showed that there were no significant differences on any of the nine scales, which measured the progress in the seven areas, between the level of average performance of the three experimental groups of trainable mentally retarded children: the public school group, the group at the Opportunity Center, and the State School group. The decision was to reject the hypotheses as follows:

(1-a) The progress of the trainable children attending special classes in the public schools is greater than that of trainable children attending similar classes maintained by community agencies or classes in residential schools.

(1-b) The trainable mentally retarded children who live at home and attend special classes maintained by the public schools and by community agencies make greater progress than do those who live in a residential school and receive training in classes at that school.

c. Hypothesis 1-c

The results further indicated that there were statistically signigicant differences between the level of the average performance of the four groups in each scale which measured the progress in the seven areas. The four groups were the three experimental groups, who participated in the organized training program, and the control group, who did not participate in an organized training program.

(1) The average performance of the experimental groups was significantly above that of the control group on six of the nine scales. Those scales were Social Adjustment; Self Care; Language Development; Physical Development, Gross Muscles (without equipment); Arts and Crafts; and Economic Usefulness.

(2) The average level of performance of two of the experimental groups was clearly superior to that of the control group on the scales of Physical Development, Gross Muscles (with equipment), and Music, while the performance of one experimental group was probably significantly superior to that of the control group.

(3) The average level of performance of two of the experimental groups was above that of the control group on the scale of Physical Development, Small Muscles, while the average performance of one experimental group was probably above that of the control group.

In view of the above findings, the decision was to accept the hypothesis that the progress of trainable children who participated in an organized training program in special classes under the direction of competent teachers is greater than that of those trainable children living at home and not participating in such an organized training program. This hypothesis is stated as 1-c in Chapter I.

d. Hypothesis 2-a

The findings of this study indicated that the progress in each area of training except that of economic usefulness of the subjects in the experimental groups who were classified as mongoloid was not significantly different from that of those who were not classified as mongoloid. The decision, therefore, was to accept the null hypothesis, that the progress of trainable children who are classified as mongoloid is not significantly different from that of those who are not classified as mongoloid except in the area of economic usefulness, where the null hypothesis is rejected. This hypothesis is stated as 2-a in Chapter I.

e. Hypothesis 2-b

The results of this study further indicated that there were no significant differences between the progress in the seven areas of training of those subjects with medically established neurological involvements and the progress of those without medically established neurological involvements. The decision, therefore, was to accept the null hypothesis, that there is no significant difference between the progress of those trainable children with medically established neurological involvements and the progress of those without such involvements. This hypothesis is presented as 2-b in Chapter I.

f. Hypothesis 2-c

It was further indicated that there were no significant differences between the progress in the various areas of training of those subjects observed as hyperactive and that of those not observed as hyperactive, except in the areas of economic usefulness and arts and crafts. The decision was to accept the null hypothesis, that the progress of trainable children who are not observed as hyperactive is not significantly different from that of those who are observed as hyperactive, except in the areas of economic usefulness and arts and crafts, where the null hypothesis is rejected. This hypothesis is presented in Chapter I as 2-c.

g. Hypothesis 2-d

The findings also indicated that there were no significant differences between the average performance of the trainable children with physical handicaps and the average performance of those without physical handicaps except on three of the nine scales which measured the progress in the seven areas. These three scales were Physical Development, Small Muscles; Arts and Crafts; and Music. The decision was to accept the null hypothesis, that there is no difference between the progress of trainable mentally retarded children without physical handicaps and that of those with physical handicaps except in the areas of music and arts and crafts, where it is rejected. In the area of physical development, the decision was to accept the null hypothesis in the area of physical development pertaining to gross muscle development with and without equipment to reject the null hypothesis pertaining to the small muscle development. This hypothesis is stated in Chapter I as 2-d.

h. Hypothesis 2-e

The results of this study indicated that there were no significant differences between the average progress of those trainable children with language handicaps and the average progress of those without language handicaps except in the area of language development. The decision, therefore, was to accept the null hypothesis, that the progress in the seven areas of training of trainable mentally retarded children is not significantly different from that of those trainable children with language handicaps except in the area of language development, where it is rejected. This hypothesis is stated as hypothesis 2-e.

2. Conclusions Pertaining to Trends

a. The over-all pattern of performance for the three experimental groups indicated that they made more progress the first year than the second year.

b. The pattern of performance indicated that the experimental groups as a whole tended to make more progress during the first half of each year than during the last half of each year.

c. The over-all pattern indicated that the three experimental groups, as a whole, experienced regression at times during the two-year period of the research even though the over-all pattern was one of success.

d. There were significant differences between the individuals in their over-all average of performance over the two-year period.

C. Recommendations

The findings of this study indicated factors which may be related to research and training for the trainable mentally retarded child. These factors are discussed in relation to these two fields, as follows:

1. Research

The present research was constructed to use a small sample, and, therefore, the statistical treatment of the data was designed for such small samples. The results yielded certain trends. It is suggested that further information pertaining to these trends would be gained if additional studies of larger samples were initiated. It is recommended that such studies have more than one group in each of the experimental environments, as well as control groups, in several communities. The need for the rotation of teachers, the control of curriculum, and the rating of the progress of the subjects should be given special consideration. In addition, further consideration should be given to the following trends indicated in this study:

a. The trainable mentally retarded children participating in the training program did make significant progress in the areas of training, and they did make significantly more progress than did those trainable children not participating in such a training program.

b. There were no significant differences between the progress of the trainable children attending the training classes in the three experimental environments; namely, the public school, the segregated community center, and the residential school.

c. The pattern of the average performance for the groups, as a whole, who participated in the training program indicated that more progress was made during the first year than during the second year.

d. The pattern of the average performance for the groups, as a whole, participating in the training program made more progress in training the first half of each year than during the last half of each year.

e. The intelligence quotients obtained for subjects at the beginning of the research and those obtained at the end were essentially the same, as in only three cases of the 30 subjects were there differences of 10 or more points between the two scales.

f. The social quotients established on the Vineland Social Maturity Scale at the beginning and at the close of the research were essentially the same as in only five cases of the 30 subjects were there differences of 10 or more points.

2. Training

a. The information yielded by this research indicated that trainable children did make significant progress in an organized program which was under the direction of competent teachers, and that there were no significant differences between the level of average over-all progress for the three experimental groups; the group at the public school, the group at the local segregated facility, and the group at the State School.

b. The findings further indicated that the hyperactive child could make essentially the same degree of progress as other trainable children.

c. The degree of progress of those children with physical handicaps was not significantly different from that of those without physical handicaps, except in the areas of arts and crafts and physical development, small muscles. Both of these areas required essentially the use small muscles.

d. The children with language handicaps made essentially the same degree of progress except in the area of language development.

e. The information obtained from the staff of the public school where one experimental class was housed indicated that the class for trainable children was not considered a disrupting factor nor a negative influence, and that it was accepted by the teachers and the so-called "normal" child in that building.

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APPENDIX

APPENDIX

SAMPLE OF LESSON PLAN

Plan 6, A

TIME	ACTIVITY	METHODS AND MATERIALS
1.	Self Care--upon arrival take off wraps and hang up. Check appearance--comb hair, etc.	Refer to Plan 1, A See Method 1
2. 8:30	Child initiated activities Emphasize: sharing, taking turns, making choices, developing work habits, care of materials	Method 2
3. 8:50	Opening Flag salute America Sing "Good Morning" Roll call Count pupils Discussion of something pertinent Social adjustment Thankfulness--using flannel board exercise Emphasize: group activities, taking turns, language, number concepts, name	Refer to Plan 1, A Method 3 Concept of thankfulness: teacher-made flannel board, pictures of food, clothing, shelter, family Method 49, A, 49, B
4. 9:20	Activity for small muscles and art Looking for pictures or illustrations for book and make Thanksgiving dinner book	Construction paper. Good pictures of food. Paste. Scissors. Methods 27, 49, C

SAMPLES OF TEACHING METHODS

12. Cutting

a. Teach use of scissors.

   (1) Demonstrate proper holding and use.
   (2) Allow child to handle and manipulate scissors experimentally.
      (a) Assist child in placement on hand (thumb and middle finger).
      (b) Allow child to practice opening and shutting.

b. Practice cutting.

   (1) Distribute paper--use construction paper, strips 6" x 2" for easy handling and cutting.
   (2) Steps in learning to cut:
      (a) Practice snipping.
      (b) Practice cutting on straight line.
      (c) Practice turning paper while cutting.
      (d) Practice cutting circles.

c. Expand this procedure to include all cutting in curriculum activities.

39. Rhythm Instruments

a. Children clap to one-two rhythm while sitting in group.

b. Tap feet to one-two (march) music.

c. Stand and mark time to music.

d. At this point marching may be developed. Children may march in line carrying flag.

e. Introduce simple instruments: rhythm sticks, first used with teacher demonstration. Emphasize listening for beat.

   (1) Children experiment with sticks.
   (2) Group develops rhythmic beat.
   (3) Group develops starting and stopping with music.

f. Introduce other simple instruments: jingle clogs, jingle sticks, wrist bells, tone blocks.

g. Introduce drum and tamborine after some skill is developed with other simple instruments.

h. Introduce triangle when children have more skill with instruments and when children are ready for variation in rhythm and tone.

6. Toilet Habits

Bathroom habits to be taught:

a. Close door.

b. Use toilet facilities properly.

c. Adjust clothing before leaving bathroom.

d. Wash with soap and dry hands (without playing).

e. Close faucet.

f. Care for towel.

SAMPLE OF RATING SCALE

Scale for Social Adjustment

I. Participation

A. Sharing:

1. Initiates sharing
2. Shares willingly
3. Shares when reminded or suggested
4. Shares with repeated urging
5. Does not share--even when urged

B. Taking turns:

1. Initiates taking turns
2. Takes turns willingly
3. Takes turns when reminded or suggested
4. Takes turns with repeated urging
5. Does not take turns even when urged

C. Cooperating:

1. Initiates cooperative situations
2. Always cooperates willingly
3. Cooperates upon suggestion
4. Cooperates after repeated urging
5. Does not cooperate or assist

D. Manners:

1. Speech and behavior are socially acceptable
2. Has occasional lapses from socially acceptable behavior
3. Speech and behavior are socially acceptable when reminded
4. Speech and behavior are socially acceptable when demanded
5. Always disrespectful and discourteous

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